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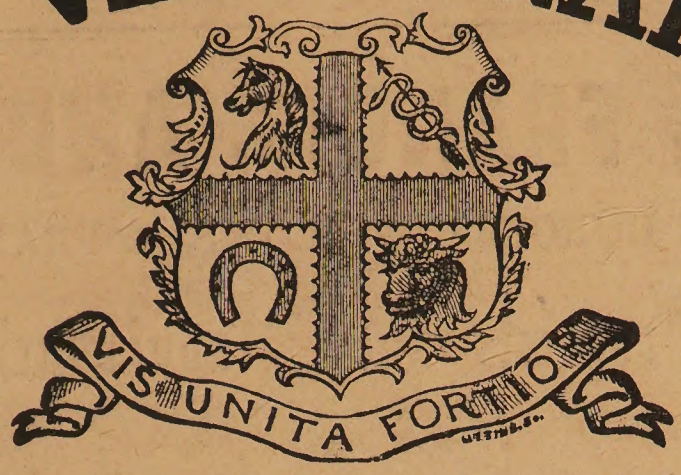

A MONTHLY JOURNAL OF VETERINARY SCIENCE.

FEBRUARY, 1891.

EDITED BY

PROFESSORS SIMONDS, BROWN, AXE AND McCALL.

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A SCHOLARSHIP of £25 per annum, tenable for TWO YEARS, dating from October, 1891, will be awarded at the close of the ensuing Session of 1892; and an additional Scholarship of the same amount in each succeeding year.

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RICHARD A. N. POWYS, SECRETARY.

BOOKS, ETC., RECEIVED.

A Manual of the Diseases of the Camel. By John Henry Steel, V.S., A.V.D., F.R.C.V.S., F.Z.S., &c.

The Quarterly Journal of Veterinary Science in India, October, 1890.

The Journal of Comparative Medicine and Veterinary Archives, December, 1890.

Polymastism, with Reference to Mammæ Erraticæ and the Development of Neoplasms from Supernumerary Mammary Structures. By W. Roger Williams, F.R.C.S., &c.

The Johns Hopkins Hospital Bulletin, Vol. I, No. 8.

Vinton's (late Morton's) Agricultural Almanac, 1891, *a Year Book for Farmers and Landowners.*

Agricultural Students' Gazette, December, 1890.

The Dog Owners' Annual for 1891.

The following foreign publications are to hand:—*Annales de Medecine Vétérinaire,* January, 1891; *Oesterreichische Monatsschrift für Thierheilkunde, und Revue für Thierheilkunde und Thierzucht,* January and February, 1891; *Archivio per le Scienze Mediche, La Clinica Veterinaria* (Milan); *Zeitschrift für Veterinärkunde mit besonderer Berücksichtigung der Hygiene,* Berlin, January, 1891; *Recueil de Médecine Vétérinaire,* December, 1890; *Zeitschrift für Fleish- und Milchhygiene,* October; *Verlag des Archivs für Animal, Nahrungsmittekunde* (Cologne, Rhine), and *Bulletin et Mémoires de la Société Centrale.*

Papers received: *Mark Lane Express, North British Agriculturist, Land and Water, The Field, Live Stock Journal, Bell's Weekly Messenger, Agricultural Gazette, Farmers' Gazette,* Dublin; *Isle of Wight Observer and Chronicle, The Isle of Wight County Press, Edinburgh Evening Dispatch, The Gazette,* Montreal; *The Essex County Chronicle,* and *The Denver Times,* U. S., January 2nd.

It is particularly requested that in future the British and Foreign Exchange Journals be directed to the EDITORS of the *Veterinarian,* 22½, Bartholomew Close, London, E.C.

NOTICE TO CORRESPONDENTS.

Last month we were favoured—and again this—with the details of cases of disease of unusual interest occurring in private practice. The custom which prevailed among veterinary surgeons some years since of promptly reporting such cases for publication is, we trust, about to be revived, tending, as it must do, to the advantage and onward progress of the profession.

We regret that the great pressure on our pages this month has again necessitated withholding the discussion on Mr. Banham's paper on "Soundness and Unsoundness in Horses," and other important matter.

To ensure the publication of Cases and Communications in the coming Number they should arrive by the 15th of the Month.

LETTERS, REPORTS OF CASES, ETC., MAY BE DIRECTED EITHER TO PROFESSOR SIMONDS, J.P., RYDE, ISLE OF WIGHT, OR TO THE "EDITORS," AT THE ROYAL VETERINARY COLLEGE, OR TO THE CARE OF ADLARD & SON, PRINTERS, 22½, BARTHOLOMEW CLOSE, LONDON, E.C.

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THE

VETERINARIAN.

VOL. LXIV. No. 758. FEBRUARY, 1891. Fourth Series, No. 434.

Communications and Cases.

"ARE BLISTERS HURTFUL OR BENEFICIAL?"

A Recent Correspondence in the 'North British Agriculturist.'

By Professors Williams and McCall.

To the Editor.

"Sir,—In your review in the *North British Agriculturist* of my work on 'Veterinary Medicine' (12th November), and in a long letter published in your last issue, I am for the first time attacked in front as to my written opinions and ideas upon the action of blisters; but your reviewer and contributor go rather too far, and the title of the controversy should be, 'Are Blisters Hurtful or Beneficial in Acute Diseases of the Chest?' As already quoted, I condemn them, and maintain every word of that quotation, and can merely look back over a practice in Bradford and in Edinburgh extending over thirty-three years, and can honestly compare my success with that of any other practitioner in the United Kingdom, without having inflicted the pain and misery upon my patients which are induced by the application of the so-called counter-irritants to the sides and breasts.

"Your correspondent states:—'Most of us have personally realised the benefits of counter-irritation by smart friction, by mustard, and by cantharides, in throat and chest complaints; and in the lower animals, although their feelings cannot always be readily ascertained, from similar

treatment doubtless experience similar relief.' In my younger days I, like your correspondent, believed all this, and have occasionally seen what seemed to be marked relief of distressing symptoms brought about by mustard or other sharp irritant; but I have seen many many instances where much harm has been done; respiratory movements increased, febrile excitement intensified, and a fatal result brought by this line of treatment; and have also seen, and continually do see, many cases of lung congestion subside without any irritating applications to the sides; and the result, which in the past could have been attributed to the irritant, is now seen to be gained by other and more humane means.

"Your correspondent again says:—'When a blister is applied to parts contiguous to the seat of inflammation, as to the skin overlying an inflamed pleura, by reflex action, the dilated inflamed vessels are contracted, and the natural effort to overcome this obstructed capillary circulation is assisted.' How does your contributor know all this? Has he ever seen what effects a blister applied to the skin has upon the pleura? Until he can give positive evidence of the correctness of the above quoted assertion, his theories and speculations can be kept at home with very great advantage to the rising generation of veterinary practitioners.

"It is very true, as stated by you in your review, that I stand almost alone in my condemnation of the prevailing method of treating chest diseases. For many years, and before I became a teacher, I stood *quite* alone, and at the present time this institution is the only college in Great Britain in which, what you consider a heresy, is taught; but I do not fear the result of this discussion which you have inaugurated.

"When I practised in Bradford, the late Professor Strangeways, then professor of anatomy with Professor Dick, whilst on a visit to me, said, 'Ah, these chest cases of yours would all die if they were in Edinburgh; the cold winds there would very soon make you alter your treatment.' A few years afterwards, when I had been established in Edinburgh for some time, the late Mr. Tom Taylor, of Manchester, said, 'I don't wonder at these chest cases of yours doing so well, you have such pure air in Edinburgh. If they were in Manchester, they would all die.' I remarked, 'I have heard similar observations before about Bradford, which, atmospherically, is pretty much like Manchester.'

"Now, sir, as I am very busy, I cannot say very much

more; but this I will say, that for at least twenty-eight years I have not used a pound of mustard, nor have I, in one single instance, blistered a horse's sides with cantharides, and with a result eminently satisfactory both to myself and clients, to many of whom I can refer you if necessary.

"Whilst horses have been dying under the care of others, I can, with confidence and gratification, state that I very very seldom lose a case of chest disease.

"I am, &c.,

"W. WILLIAMS."

"ARE BLISTERS BENEFICIAL OR INJURIOUS?

"PROFESSOR WILLIAMS, in a letter in last week's *North British Agriculturist*, replying to editorials on the subject, stoutly maintains his contention that blisters are injurious in diseases of the chest; appeals to thirty-three years' successful practice in support of his views; declares that for twenty-eight years he has not used a pound of mustard; and avers that while patients with chest diseases have been dying under the care of other practitioners, he 'very very seldom loses a case.' But does this success depend upon the non-use of blisters? We wot not. It doubtless results from a happy combination of judicious, suitable measures, hygienic and medicinal. Other practitioners in town and country, who carefully attend to the comforts and medical treatment of their patients, but also use blisters, obtain equally favorable results. Although the Professor's views have been propounded for upwards of a quarter of a century, they have not been generally adopted. They may, indeed, have led to the abandonment of severe indiscriminate blistering; but counter-irritation in chest complaints is still in universal use, and practitioners generally continue to have full faith in its efficacy, both as a general stimulant in prostrated subjects, and as a topical means of relieving local inflammation. In all the great Continental schools, where scientific investigation and accurate clinical observation alike receive special attention, blisters continue to be used. Some of Professor Williams's pupils, for a time after starting in practice, follow the teaching of their master, and eschew blistering; but not quite satisfied with the results, many revert to the old practice, and use mustard and other counter-irritants in many chest diseases.

"Where diseases differ in their severity in different patients, and are, moreover, treated by several different

medicaments, it is obviously difficult to determine the actual curative results produced by any one medicament used. Hence the uncertainty in gauging the benefits which, we believe, result from the judicious use of blisters, or, as Professor Williams might put it, the proportionate injury which they inflict. The clinical experience of the great majority of educated practitioners is against the Professor's view; but it would, nevertheless, be satisfactory if the question were settled to demonstration, as it might be by two series of cases of chest diseases treated in some large public institution in exactly the same manner, but the one with blisters and the other without them. Until some such experiments are carefully carried out, it will probably be difficult either to convince the Professor of the untenability of his views, or to induce the great body of practitioners who now use counter-irritants in chest diseases to alter their practice."

"ARE BLISTERS BENEFICIAL OR INJURIOUS?

"SIR,—There are three things besides the challenge in your last week's correspondent's letter deserving of consideration:—1st. 'But does this success depend upon the non-use of blisters? We wot not. It doubtless results from a happy combination of judicious, suitable measures, hygienic and medicinal. Other practitioners in town and country, who carefully attend to the comforts and medical treatment of their patients, but also use blisters, obtain equally favorable results.' Now, I ask your readers, if by judicious treatment, medicinal, hygienic, &c., I succeed without blisters, as well as those who use them, am I not entitled to their verdict? If my success is as great without them, what is the use of them? But I say more. I have greater success, and willingly accept your correspondent's challenge to settle the question, by having 'two series of chest diseases treated in some large public institution, the one with, and the other without, blisters.' Your correspondent says, 'in the same manner.' I do not understand what he means; but if he means that the same medicines should be used by both parties, I object; each party to have perfect freedom to use what medicines, &c., as suit his own ideas. 2nd. The other matter referred to by your correspondent is the following:—'Some of Professor Williams's pupils, for a time after starting in practice, follow the teaching of their master and eschew blistering; but not quite satisfied with the results, revert to the old practice,

and use mustard and other counter-irritants in many chest diseases.' This is quite true, some weak-kneed ones, and particularly those who have been pupils before coming to the college, 'have seen practice,' often take unkindly to my teaching, and soon revolt into the old groove. I met one of these last summer at the sea-side, who told me he was very busy and should not be away from his practice, but he felt compelled to run away for a day or two, as he had lost eleven horses, all in one stud, from chest disease, within the previous week or two. I asked him how he treated them; he evaded giving a direct answer by stating that my way was the best after all; that three different veterinary surgeons had been called into consultation with him. One had recommended one thing, the second another, and the third something different, but every one agreed as to the value of counter-irritation, but the horses died. 3rd. Regarding 'all the great Contenital schools, where scientific investigation and accurate clinical observation alike receive special attention, blisters continue to be used.' Granted, but does your correspondent know the results? Perhaps he does. I do.

"I am, &c.,

"W. WILLIAMS."

"ARE BLISTERS HURTFUL OR BENEFICIAL?

"SIR,—Being a reader of the *North British Agriculturist* I have not been unobservant of the discussion which has been going on under the above title, and although I cannot admit that anything which has been written by Professor Williams necessitates my entering the list of combatants, still, as the learned Professor seems to be pleased that he is 'for the first time attacked in front as to his written opinions and ideas upon the action of blisters,' I feel inclined to offer him satisfaction in attempting to refute much that he has written on this subject.

"Such being the case, I shall pointedly refer to what he has written in his work and also in your columns. In his work on 'The Principles and Practice of Veterinary Medicine,' as has already been pointed out by you, although, not in the same language, he says, 'Irritation of the sides and breasts is injurious in *all* instances of chest disease in the horse, except in a condition presently to be described, and for the following reasons:

"'1st. It cannot and does not remove the internal inflammation. Many *post-mortem* examinations have convinced

me of this. During the summer of 1873 I had a good opportunity of demonstrating this fact to my students. A horse newly bought by a dealer died from pleurisy, and its value was in dispute between buyer and seller. On viewing the carcass, both myself and students were struck with the violence of the inflammation of the skin upon the sides, induced by the *repeated application* of the irritants. Some of the students having been pupils of gentlemen who advocated the "counter-irritation" theory were under the firm belief that no internal inflammation could exist when the external was so marked. The result, however, proved the fallacy of the hypothesis, for the pleura was intensely inflamed.'

"Now, with all deference to Professor Williams, I see no reason in the case he has instanced warranting the deduction that 'irritation of the sides and breast is injurious in all instances of chest disease.' We are informed that the animal 'died from pleurisy,' and that it had 'repeated applications of irritants to its sides,' and that the Professor and his students were 'struck with the violence of the inflammation of the skin.'

"Torture a poor animal by '*repeated* applications of irritants to his sides,' and then to be 'struck' with the violence of the local inflammation thus set up! Might I ask what the Professor and students expected to find under such circumstances? If they had found no indications of an acute pre-existing inflammation in the skin from the '*repeated* applications of the irritants,' then they might have been 'struck,' but not otherwise.

"But I ask again, why were they 'struck?' and the answer is, they had an idea in their head 'that no internal inflammation could exist where the external was so marked,' and because they had this idea, 'counter-irritation of the sides and breast is injurious in *all* instances of chest disease in the horse.'

"But the advocates of 'counter-irritation' under given conditions, and of whom I willingly confess to be one, do not subscribe to the doctrine 'that no internal inflammation could exist where the external was so marked.' How could we, having similar opportunities of making *post-mortem* examinations as Professor Williams, and of observing results? Need I tell Professor Williams that the actions of 'counter-irritants' rest not on the theories or views which professors and students entertain. They rest on the susceptibility of the body to which they are applied, and undoubtedly their action is regulated by the influence which they exercise on

the cell elements of the tissues to which they are applied, and by 'reflex action' through the nerves on the circulation.

"'2nd. Another argument which tells against blisters, is the fact that their advocates differ as to the stage at which they ought to be applied. One party says they cannot be too soon, in order to counteract the internal inflammation, by drawing the morbid action of the blood to the surface; whilst others say that external irritants do harm whilst there is any fever present, and that they should always be applied after the pulse has fallen and when convalescence has commenced, in order to stimulate the removal of the products of inflammation. I, however, fail to see the necessity of doing this, for the removal of the exudate is a physiological process, best accomplished when uninterfered with, and counter-irritation at this period can only retard the recovery, or, by again setting up the febrile condition, bring about a fatal termination.'

"Here, again, the Professor drags in theories, and because they do not square again, declares 'counter-irritation is of no use in chest affections,' and that the exudates are best left to be dealt with by the physiological process of absorption; and then he commences to write of the value of hot-water applications to the skin, and thereafter the application of ammonia liniment to the chest; and what, I ask, is this but a *pronounced method of counter-irritation to the skin of the chest?*

"Regarding the exceptional condition to which the Professor has referred, he writes—'there is, however, a very rare exception to these objections to external stimulants during the second stage of the disease (pleurisy) occurring in that condition where the horse neither gets better nor worse for several days, "hangs fire," as it is commonly termed. In such instances a weak solution of mustard by gently stimulating the skin will often induce the beginning of convalescence, and act as a stimulant to the whole body. In no other condition are counter-irritants beneficial, and in this care must be taken not to apply them too strong nor for too long a time. If one application does no good it is not advisable to apply another, but if the horse seems to improve for a time and then relapse, a second or even a third application may be advisable.'

"The Professor thus admits that in the second stage of pleurisy, and in what may be called a 'critical case,' counter-irritation with two or three ounces of mustard 'will often induce the beginning of convalescence, and act

as a stimulant to the whole body;' and if so in a 'critical case,' why not so in less severe ones?

"While not prepared to testify quite so unreservedly to the good effects of two or three ounces of mustard, I also have had most favorable results from the application of twelve ounces, but more frequently in the first stage of the disease than the second, and if I were only called in sufficiently early I would not postpone its application till the second stage.

"But to proceed; the third reason assigned by Professor Williams for his antipathy to counter-irritants is thus stated: 'The application of blisters causes pain and increases the fever. If applied to the sides they impede the respiratory movements by the pain they cause, and thus add to the distress and suffering of the animal.'

"Now at the first glance these appear to be serious objections, but if the so-called blisters be restricted to the application of half a pound of mustard to each side of the chest and applied to the greater part of the whole chest, then I maintain that they are frivolous. Some horses 'fret' much under a sinapism, others very little; but in no case can the pain be severe, judging of what we personally know to be the action of mustard on the delicate skin of the human subject. But admitting that the subject experiences pain, that pain only lasts for a short period of time (two hours at most), and if the after consequences of that suffering should be marked relief (as in my own practical experience it is in ninety cases out of 100), are we not justified in incurring that pain?

"But would 'counter-irritation' be of any use unless it produced a certain amount of 'pain' during its action? I think not; and the action of mustard in the quantity named and covering the surface specified, in no instance in all my experience has pained the animal or disturbed his breathing to an extent that I considered prejudicial to his recovery. I wish my patient to feel, and evidence that he does feel, the action of the mustard on his chest, and if his pulse and breathing be in no way increased, and his chest to the touch of the finger gives no evidence of pain, I would very willingly have him handed over to Professor Williams to treat, my experience in a large majority of such cases being that they either die or make a very tedious and imperfect recovery. So much for the 'pain;' now for the 'fever.' In all acute chest affections we have fever or increase of temperature, and as the disease advances so does the temperature increase, until the 'acme' of the disease has been reached, when in

favorable cases the temperature gradually declines and finally becomes normal. Will mustard applied under the circumstances detailed seriously increase the temperature? It will not. In a healthy horse it does not, and in inflammation of the lungs from one half of a degree to a degree will cover it, and as it falls again in the majority of cases within twelve hours, I think it is a point of no consequence. Regarding the absorption of cantharadine and the consequent irritation of the urinary organs, I heartily endorse all the Professor has advanced in condemnation of its use as a counter-irritant in chest affections, but in the west of Scotland veterinarians have never to my knowledge made use of it; and, speaking for myself, I have never used it or recommended its use to my students for any such purpose.

"To emphasise how little disturbance in pulse, temperature, and breathing results from the application of mustard as a 'counter-irritant' in inflammation of the lungs, I shall now give the particulars of a case which I prominently brought before my students during the present controversy, and which entered the infirmary of the college here on the 5th inst.

"*History.*—Clydesdale mare, six years of age, has been in present owner's possession for last six months. For the past two days has ate almost no food, and being a quick, ready mare in her work and kept working, she is much 'tucked' up, *and* looking excited and exhausted. Before handing the mare over to the hospital surgeon for treatment and observation, I made a careful examination of the animal. Her pulse was 92, and weak. Respiration 31, and laboured. Temperature within the rectum 104·4°. The mare had walked to the college, a distance of fully two miles from her stable, and she was examined within a few minutes of arrival. On ausculation the left lung was found 'crepitating' and dull to vesicular sound, and at a point distinct 'friction sound.' The right lung 'vesicular murmur' distinct, but harsh and exaggerated.

"*Diagnosis.*—Pneumonia of left lung, with limited pleurisy.

"*Treatment.*—An extensive mustard cataplasm was ordered to be instantly applied to both lungs, and febrifuge medicine administered, bandage legs, and diet prescribed. The treatment at 11.30 a.m. commenced with the administration of a *febrifuge and anodyne* drench, but before it was administered the pulse, respiration, and temperature were again noted, and they ran as follows:—Pulse 67; respiration 32; temperature 104·4°. The falling of the pulse from 92 to

67 in half an hour to a non-professional observer may appear strange, but there is nothing remarkable in this. A horse at rest in health may have a pulse of 45, and after a brisk trot it may number 70; and in the weak state in which the animal was walking up the hill to the college no doubt sent her pulse up from 67 to 92. The mare experienced *pain* from the application of the mustard which was well rubbed in by the hands, and after its application paper was placed over all the surface of the chest to which the mustard had been applied, and a 'body sweeler' (with eyes) laced on top. The paper not only keeps the mustard in its place, but also prevents the heat of the parts from escaping, being a non-conductor of heat. The advantage of the 'body sweeler' is, that being laced it fits exactly and does not interfere with the movements of the ribs, and the animal may lay down and get up frequently without disturbing the rugs, or allowing cold air to strike upon the abdomen or chest wall. At 1.30 p.m. the pulse was 72, respirations 44, and temperature 105°. At 2.50 p.m. pulse 68, respiration 34, and temperature 105·2°. At 9 p.m. pulse 70, respirations 28, and temperature 104·2°. In this case in two hours from the application of the 'counter-irritant' the pulse had risen from 67 to 72, the respirations from 32 to 44, and the temperature one fifth of a degree. But was this disappointing to me? Nay, it was the very reverse, and what I wished and hoped to find. In three hours the pulse was only one beat, and the respirations two movements more per minute, and the temperature two fifths of a degree higher than before the application of the 'counter-irritant' or mustard.

"At 9 p.m. the same day the pulse was 70, respirations 28, temperature 104·2°, so that in ten hours from the application of the mustard the respirations had fallen from 32 to 28, and the temperature from 104·4° to 104·2°.

"Following day, Saturday, 8.30 a.m, pulse 56, respirations 24, temperature 103°. We thus observe that notwithstanding the application of as severe a 'counter-irritant' as I ever apply or recommend to be applied in a chest affection, and which 'counter-irritant,' according to Professor Williams, sends up the pulse, increases the fever, and disturbs the breathing to an alarming extent, we had in twenty-four hours a decrease of 11 pulsations and 8 respirations per minute, combined with a fall of temperature (fever) amounting to almost 2°. At 4 p.m. same day pulse 56, respirations 22, temperature 103°. At 9 p.m. pulse 54, respirations 22, temperature 103°.

"Sunday, at 2 o'clock, morning, pulse 52, respirations 22, temperature 104°. At 10 a.m. pulse 44, respirations 20, temperature 103°. At 9 p.m. pulse 45, respirations 22, temperature 102·2°.

"Monday, 9 a.m., pulse 42, respirations 18, temperature 100·4°. The further changes in pulse, respirations, and temperature require no comment, and I may just add, that in a fortnight the mare left the infirmary convalescent, and to all appearances not much the worse for her serious illness.

"Coming now to what has been written in the pages of the *Agriculturist*, your veterinary editor (Mr. Finlay Dunn) says (and few veterinarians are better qualified to express an opinion)—'Not only do the records of clinical experience justify the use of blisters, but sound physiological explanation can be given of the manner in which they overcome morbid processes. When a tissue is inflamed the minute capillary vessels become paralysed and dilated, and hence a retarded stream of blood flows through them; but around the inflamed spot, as a natural effort to overcome this retarded movement, increased circulation occurs. When a blister is applied to parts contiguous to the seat of inflammation, as to the skin overlying an inflamed pleura by *reflex action*, the dilated inflamed vessels are contracted, and the natural effort to overcome this obstructed capillary circulation is assisted. The blister thus develops and furthers the increased functional activity, which *lessens* the *vascular congestion*, *tension*, and *pressure*, as well as the pain of the inflamed part. In this manner relief is afforded in the *earlier stages* of inflammation.' And to these observations we have Professor Williams replying in the following terms:

"'How does your contributor know all this? Has he ever *seen* what effects a blister applied to the skin has upon the pleura? Until he can give positive evidence of the correction of the above quoted assertion his theories and speculations can be kept at home with very great advantage to the rising generation of veterinary practitioners.'

"Now, may I ask, what benefit can be obtained in raising an argument in your paper or any other on the subject of 'counter-irritation' in chest affections if the champion of 'non-counter iritation,' the individual who prides himself in standing 'quite alone' in its defence, when 'attacked in front,' instead of replying in courteous language to convince his opponent, 'snapes' at him like the proverbial 'dog in the manger?'

"It is for Professor Williams to *prove*, not to dogmatically assert without proof, as he has done, that the opinions expressed

and written upon the subject of 'counter-irritation' and 'reflex action' are fundamentally wrong, and that he has been in the chest and '*seen* what effects a blister applied to the skin has upon the pleura'—that they are in direct opposition to the experiments, deductions, and teachings of those who advocate their use.

"As I hope Professor Williams will (nothwithstanding that he is 'very busy') take the time and trouble to place before us the results of *his* experiments on 'reflex action' by 'counter-irritation,' I will draw this, my first letter on this subject, to a close, by a quotation from an author I very much admire:

"'Counter-irritation is a term which has excited much discussion; the word itself is impeached. It is no part of this inquiry to consider the accuracy of the word, or even the way in which counter-irritation acts. These facts simply will be used that *two inflammations do not flourish together*. That over and over again a patch of inflamed skin has removed adjacent inflammations which no drug could touch. I have repeatedly known *in my own person* a smart catarrhal bronchitis relieved in sixty minutes by the application of a large mustard plaster. I have several times seen an acute synovitis of the knee completely disappear in twenty-four hours after the application of a strong solution of nitrate of silver. I have frequently seen an acute orchitis entirely relieved in twenty-four hours after counter-irritation to scrotum and thigh.

"'Before looking at the means which will best remove an inflammation, let us look at the circumstances which will make it worse. If a part be inflamed give it plenty to do. Small print to read for an inflamed eye, long walks for an inflamed joint, and so on. See that the inflamed part has plenty of blood. Keep it hot, and the rest of the body and the surrounding air cold. Especially see that no *second inflammation* interferes with the prosperity of the first; give the inflamed part space and free opportunity to swell, and let it hang well down; and add to the general discomfort by introducing a splendid combination of drugs into the stomach. To adopt the exact and extreme opposite of all these means is, I think, the best way to cure inflammation. Complete rest is not so much a remedy as the essential foundation of all other remedies. A *second* and a *smart* inflammation of an adjacent patch of skin over an independent vascular region, will vigorously divert the blood stream from the primary inflammation, and develop a new outlet for pathological force. The more vigorous a second and separate and

safe inflammation, the less vigorous the first and more dangerous inflammation. *Counter-irritation is also the best reliever of pain.'*

"I am, yours truly,
"JAMES MCCALL."

"ARE BLISTERS HURTFUL OR BENEFICIAL?

"SIR,—I have read the reply by Professor McCall, of Glasgow, in your last issue, and am glad to note that he agrees with me upon one point, viz. in the condemnation of cantharidine blisters in chest affections in horses. I am also glad to hear that in the West of Scotland veterinarians have never, to the knowledge of Professor McCall, made use of this form of counter-irritant. But I am acquainted with many veterinarians who condemn mustard on account of its irritating and exciting properties, and always use cantharides. If even cantharidine blisters, according to Professor McCall, are injurious, and if mustard applications are injurious according to the experience of others, how can counter-irritation be beneficial at any time in chest diseases? Professor McCall has repeated well-known arguments in support of his contention, but has not in reality made the matter any clearer than it was hitherto. It is all very well to speak about reflex action, and about the action which counter-irritants have upon the cell-elements of the tissue. According to Professor McCall's own showing, the application of even mustard in the case quoted did cause an elevation of the temperature, and also increased the rapidity of both the pulse and respiration. The case was only a mild one. We have often cases here where the temperature is 106° Fahr. or even more, and it is in these extreme cases where often a slight elevation of temperature, no matter how induced, may cause a fatal result.

"I do not think, however, that any amount of writing will bring the matter to a distinct issue, and I am therefore willing to put the question to the test by conducting an experiment, and treating, say, 100 cases of chest disease without using either mustard, ammonia, turpentine, cantharides, or any other skin irritant, binding myself to apply nothing more potent than water not over 100° Fahr. The experiment could be conducted in either Glasgow, London, Manchester, Liverpool, or Edinburgh. Professor McCall would, of course, be at liberty to treat another 100 cases under the conditions advocated by him in his paper.

"I am, &c.,
"W. WILLIAMS."

"ARE BLISTERS HURTFUL OR BENEFICIAL?

"SIR,—I have read with a feeling of great disappointment Professor Williams' reply to my letter in your issue of 31st ultimo. I had anticipated a reply proving that the Professor knew not only more about 'reflex action' than any other of his contemporaries, but that he could, and would, *prove* to them that what they did know was founded on error.

"As it is, however, he has done neither the one nor the other, and, in fact, what he has said and done may be stated thus: '*I* have formed an opinion that "counter-irritation" in chest affections is not beneficial, but hurtful, and therefore the practice must cease.'

"As it is evident Professor Williams has no relish for a discussion on the action of 'counter-irritants,' at least in the columns of a non-professional periodical (but he should have thought of this before he lifted his pen), I will not press him further here; but I cannot *now* allow the discussion on such an important subject to terminate in such an *unsatisfactory manner*, and accordingly I have arranged to transfer the correspondence to the pages of the *Veterinarian*, and further, to deliver a lecture on 20th proximo to the members of the veterinary profession at Newcastle-upon-Tyne, the subject being 'The Action and Beneficial Effects of "Counter-Irritation" in Chest Affections.'—I am, &c.,

"JAMES MCCALL."

A FEW THOUGHTS ON INFLUENZA—"WHAT IS IT?"

WRITTEN WITH A VIEW TO THE AWAKENING OF THOUGHT AND INVITING DISCUSSION BY SCIENTISTS IN OUR PROFESSION.

By THOMAS GREAVES, F.R.C.V.S.

THE epidemic which has been raging lately with so much virulence, and in some districts with such fatal result, is undoubtedly attributable to atmospheric influence; it has partaken of only one of the forms or types of influenza which occasionally invade our districts. There have been the drooping eyelids, swollen legs and sheath, fidgety and painful limbs, great tendency to very cold ears and skin, increased temperature and pulse—in many cases pulse almost imper-

ceptible—loss of appetite, dullness, and frequently great prostration; it would seem stagnation is general—but in nearly every case an entire absence of profuse nasal discharge—abscesses in the throat, or accompanied with inflammation of the lungs or pleuræ. In nearly every *post-mortem* examination it is found that there exists a condition of the blood which I propose devoting this paper chiefly to. If in any of my points I seem to exceed the bounds of ordinary description I trust my critics will think it over, and not condemn my views without a fair and serious consideration.

The Black, Viscid, Abnormal State of the Blood.

How is this produced, and what is the inference? In many cases the pulse is almost imperceptible in the temporal arteries, and in the submaxillary as if not a particle of blood was passing in these arteries. I have opened these arteries during life and found them perfectly empty; if you open the jugular vein with your largest phleam you cannot get a teaspoonful of blood (I mean in these cases where pulse is almost imperceptible). That which is felt by the nicest and most delicate touch is simply a quiver, or a vibratory motion in the artery, and dependent probably on natural or mechanical action in the vessels themselves, and more or less by the systole and diastole action of the heart itself, whilst no fluid whatever is passing through them. Now if this argument holds good in the two arteries named it holds equally good in the arteries in the whole system, both the anterior and posterior circulatory systems. This gives rise to the question—

Can a Horse Live, and for how long a time, without Blood in the Arteries?

If the absence of blood in the arteries is only of short duration, just while the disease is at its height, a change of circumstances producing favorable change in the lungs and heart, I think life may be continued for a time and the abnormal blood revivified gradually, provided always the vital organs are in a sound and healthy condition.

What is the Cause and Nature of the black, thick Blood?

I have held the opinion that in most cases lately the horses have sustained a severe chill. It may have been repeated—not one sudden violent chill, but such as has occurred more or less for several days before symptoms show themselves; probably having been overheated, then stood a time in intense cold, the blood has become perished, its vitality has vanished, it is as thick viscid fluid without life

in it, settles in the ventricles and large blood-vessels near the heart and cannot be moved; the heart beats and beats on but it cannot move this dead weight, or propel it, hence this weak imperceptible pulse. Now is this condition of of the blood purely referable (1) to direct effect of a sudden or continuous chill of the whole body, or (2) to a sudden and continued total suspension of endosmosis and exosmosis in the air-cells, thereby causing a complete cessation of this vital process and of the oxygenation and re-vivification of the blood and all its carbonic acid gas retained in it?

Can Life be continued when the Blood has no Life in it?

I think it can for a time. I am beginning to feel convinced that there is an inherent power in nature in the system—that is, in the brain and nervous system, and in the sympathetic system of nerves to carry on the function of life for a time.

Perhaps my critic would advise me to call it an abnormal state of the blood, and not blood with no life in it. Well, let us see what he makes of it; perhaps he will say it is essentially a disease of the blood. As to this I do not entirely agree with him. I know the blood has been subjected to alterations in its nature, but this I say is simply and purely attributable to the carbonic acid being retained in it and no oxygen having been able to be received and make its impression on it in the lungs.

As well might you argue that a baby that dies at a baby-farm died of disease when it is proved every vital organ is sound, but that it had received no support or nutriment for a week. Perhaps some critic will advance the scientific theory of the microbe or bacillus of influenza; this has more feasibility in it. I want scientist critics to be very clear on this point; I am not yet a convert.

How fares it with the Capillaries during the Struggle for Life?

We know on our first visit the pulse is up; instead of 40 or 42, it is 72, or 84, or 96—it may get on to 120; the temperature equally disturbed; ears and skin deathly cold; still, serious as he is, his breathing may not be accelerated, and if prompt measures are at once taken, being placed in the most favorable circumstances and every comfort attended to, provided the animal is a young one, the vital organs sound and healthy, he may weather the storm. The contemplation embodied in the heading of this section very likely had bewildered our most experienced as well as the most scientific veterinary surgeons; still we must not shirk

it, let us face it as men with a firm and resolute purpose in view. It is my opinion they are simply lying inactive, dormant if you like, a state of collapse, they cannot help themselves, they are waiting until assistance comes to their help; in the meantime every hour, nay every minute, the whole system is becoming more and more saturated with poison, which in the end causes a failure of the heart's action and death. Our last enemy can score another victory.

Well, What can be Done?

Place your patient at once in a roomy loose box, get his ears, neck, and body thoroughly warm and comfortable, give him a pint of hot ale with some carbonate of ammonia in it, or 1 oz. tincture pimento and 2 oz. gin, or some stimulant of this kind two or three times a day, and also mildly stimulate the sides once again. Nature will in most cases respond to these efforts to help her, and the mass of black, abnormal blood will by little and little become revivified, and in a few days the blood will assume its arterial colour and character, and then we can score another victory. You may use coke fires in every stall, use fumigations, sprinkle lime and other disinfectants freely over the floor, attend to ventilation and drains, allow the horse to drink one quart of hay-tea, bran-tea, or pure cold water every hour, and give him anything he likes to eat. In giving medicine as a drink great care must be taken since the horse is so stiff; and some have such a tendency to become light-headed that in raising the head to give the drink there is danger of falling from syncope. But something more is urgently wanted; and let me throw out this idea to our scientist, that experiment be at once instituted of injecting pure oxygen, or pure nitrogen, as the case may be found to require, into the air the animal breathes with a view to re-establish vigorous function of endosmosis and exosmosis in the lungs; this effected, it would leave every other treatment far in the shade.

A CASE OF SUPPRESSED STRANGLES (?)

By John Henry Loft, F.R.C.V.S., Grimsby.

Having been in practice since 1869, and not meeting with a precisely similar case to the one here named before, I thought it might interest some of the younger readers of the *Veterinarian* if I related what is to me a *very rare case.*

On Tuesday, the 16th of December, I was called in to see a black carriage mare rising four years, and was told that on the

Saturday previously, after the mare had been driven for about six miles, it was noticed that her nostrils, neck, breast, and fore-legs were splashed all over with pus-like matter and foam. The mare had been placed in a loose box, hooded, rugged, and bandaged, and had been given some roots and hot mashes. On examining her I found a little discharge coming from her left nostril, which gave out a fearful odour; the pulse and temperature were only slightly accelerated, and the appetite fairly good. I therefore came to the conclusion that it was a mild attack of influenza. I administered tonics and stimulants, with fever medicine as called for; allowed plenty of fresh air, and had her dressed well every day. The case seemed at a standstill until the morning of the 26th, when I was called to see her because she had been bleeding profusely from the left nostril. The bleeding had stopped when I arrived, but the whole place looked like a slaughter-house; the groom remarking that he never saw a pig lose more blood when being killed. I at once had the hood taken off, cold water applied to the head, and astringent lotion to the nostrils. Her pulse was small and very weak, and as she showed symptoms of collapse I administered a stimulant. Her appetite returned in the afternoon, and she ate two small feeds of mixed diet and drank some chilled water. At night she commenced bleeding again, but it soon stopped. On the 27th the mare was very weak and dull. Tonics and stimulants were again given; ears and legs very cold; pulse almost imperceptible, but appetite good. About three o'clock in the afternoon she drank nearly a pail of chilled water; directly afterwards blood spurted out of both nostrils, and staggering out of the box, she fell dead.

Post-mortem examination showed both lungs to be nearly filled with blood through the bronchial tubes. All the chief organs were very pale from loss of blood, but otherwise healthy. On cutting through a black spot on the supra-posterior part of mouth just in front of the os hyoides, I found a very large cavity, no doubt the seat of an abscess; the walls of which were absolutely sphaceletic, black, and green in colour. Amongst the *débris* I found a blood-vessel of the same colour and in similar condition, its walls being completely broken down. Rightly or wrongly, I came to the conclusion that the case was one of suppressed strangles; the abscess bursting whilst the mare was being driven on the 13th, the mortification of the walls of the blood-vessel being caused by being in contact with pus and diseased condition of the lining of the abscess, the vessel bursting through the

decayed state of its walls, and that death took place through suffocation, the bronchial tubes being filled with blood.

If any of your numerous readers can give any other explanation I shall be very pleased to have it.

THE ERADICATION OF SANDCRACK.

By J. C. James, F.R.C.V.S., Thornbury.

Many and various are the methods employed in the treatment of sandcrack. Many excellent appliances have been invented by veterinary surgeons for the alleviation of pain in this lesion of the hoof and foot of the horse, so as to enable the animal to perform the work demanded from him by his owner.

Clamping, plugging with wood, and other modes of treatment have been employed successfully, but these are chiefly mechanical and palliative; and, although the horse often performs his work well and free from lameness, the sandcrack is not eradicated unless other treatment is conjoined. Operative surgical treatment has also been resorted to for the radical cure of this disease, viz. cutting out or stripping, the French operation of stripping, and the V-shaped operation described by Professor Walley in the June number (1890) of the *Journal of Comparative Pathology and Therapeutics*.

The operation of stripping I have performed successfully, but the treatment I am about to describe is so simple and successful, that I have been induced to suggest it to my professional brethren, merely as a unit to that which is already known, and ask them to give it a fair trial before criticising it, and then I feel assured that their criticism will be favorable. Perhaps the operation has already been performed by other veterinary surgeons, although they have not recorded it; or, if so, I have missed reading it.

I have adopted this method of treatment for several years with great success. It consists in cutting through the *coronary secreting substance*, an eighth or a quarter of an inch above the extreme visible upper limit of the crack. I use an ordinary thin firing-iron heated as for firing. First have the hair cut off the coronet, and plug or clamp the crack; or, if this is not practicable from loss of horn, &c., it may be filled with tar dressing, and bound up with tarred string. Having secured the horse, have a couple of thin firing-irons heated as for firing, and cut across about an eighth or a quarter of an inch above the extreme upper limit

of the crack, well through the coronary secreting substance (at right angles to the crack), till you can see the white fibrous tissue beneath. Two or three quick strokes with moderate pressure will accomplish this. The incision may be from an inch to one and a half inches in length, and I have never known any harm result therefrom. I then apply a blister and use some carbolised oil as an after dressing. On closely examining the incision made, a small dark spot will be seen in the divided part of the coronary secreting substance, which looks like degenerated tissue.

The animal may require a few weeks' rest, according to the severity of the case, but the cut will soon fill up and grow out; and if the crack is well clamped or plugged the horse will in a few weeks be able to resume work, and as new horn is formed and the hoof grows the sandcrack will be eradicated.

I have treated some very severe cases in this way with the most satisfactory results, and some of the horses were really useless as the lesion was wide and deep, extending through the hoof into the horny and sensitive laminæ, and causing blood to ooze out at every step the animal took in progression.

Pathological Contributions.

PLEURO-PNEUMONIA.

According to the returns published in the *London Gazette*, the Board of Agriculture have in the three weeks ending January 17th, 1891, dealt with outbreaks of this disease in the Counties of Durham, Essex, Lancaster, Surrey, York (West Riding), Fife, Forfar, Linlithgow, and Midlothian. By Order of the Board 41 cattle affected with pleuro-pneumonia were slaughtered, and 422 other cattle which had been in contact with the diseased or otherwise exposed to infection were also slaughtered.

In looking over the published returns for the corresponding period of last year when the slaughter of the infected herds was being carried out by the Local Authorities, we find that 113 diseased cattle and 296 others in contact with them were slaughtered. It would appear therefore that the Board of Agriculture slaughter a much greater number of cattle as contact animals than the Local Authorities did when carrying out the provisions of the Pleuro-pneumonia Slaughter Order of 1888.

THE VETERINARIAN, FEBRUARY 2, 1891.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

DR. KOCH'S REMEDY FOR TUBERCULOSIS.

AFTER considerable delay, the reasons for which the discoverer of the new remedy for tuberculosis gives in his recent communication, the composition of the fluid which has excited much enthusiasm among medical men and raised such brilliant hopes in the minds of sufferers from the most terrible of maladies—consumption, has been made public. Extracts which we take from the *British Medical Journal* will convey to our readers an idea of the circumstances which led to the discovery of the agent, and the manner and results of its use.

"*The Steps by which the Discovery was made.*—If a healthy guinea-pig be inoculated with a pure cultivation of tubercle bacilli, the inoculation wound generally becomes sealed, and seems to heal up during the next few days. It is only in the course of from ten to fourteen days that a hard nodule is formed, which soon opens, forming an ulcerating spot which persists until the death of the animal; but the case is very different if an already tuberculous animal be inoculated. The most suitable animals for this experiment are those that have already been successfully inoculated four to six weeks previously. In the case of such an animal also the small inoculation wound becomes sealed at first, but no nodule is formed, a peculiar change taking place at the point of inoculation. Already, on the first or second day, the spot becomes hard and dark-coloured; and this is not confined to the point of inoculation, but spreads around to a diameter of 0·5 to 1 centimetre. During the next few days it becomes more and more clear that the epidermis thus changed is necrotic. Finally it is thrown off, and a flat ulcerated surface remains, which generally heals quickly and completely, without carrying infection to the neighbouring lymphatic glands. Thus the inoculated tubercle bacilli act quite differently on the skin of a healthy guinea-pig and on that of a tuberculous one. But this remarkable action does not belong exclusively to living tubercle bacilli, but also in the same degree to dead ones, whether killed by low temperatures of long duration, which I at first tried, or by boiling heat, or by certain chemicals.

"This peculiar fact having been ascertained, I followed it up in all directions, and it was then further found that pure cultivations of tubercle bacilli thus killed, after they have been ground down and suspended in water, can be injected under the skin of healthy guinea-pigs in large quantities without producing anything but local suppuration.* Tuberculous guinea-pigs, on the other hand, can be killed by an injection of very small quantities of such suspended cultures, the time being from six to forty-eight hours, according to the dose; a dose which is just insufficient to kill the animal is sufficient to produce a wide-spread necrosis of the skin

* Injections of this nature are among the simplest and most certain methods of producing suppuration free from living bacteria.

in the region of the point of inoculation. If the suspended matter be still more diluted, so that it is scarcely turbid to the eye, the animals remain alive; and if the injections be continued at intervals of one or two days, a noticeable improvement in their condition soon sets in; the ulcer at the point of inoculation becomes smaller, and finally cicatrises. This is never the case without such treatment. The swollen lymphatic glands become smaller, the condition as regards nutrition improves, and the progress of the disease is arrested, if it is not already so far advanced that the animal dies of debility.

"*Difficulties in the Way of the Therapeutic Application.*—These facts formed the foundation of a therapeutic method against tuberculosis. But an obstacle to the practical employment of such suspensions of killed tubercle bacilli was found in the phenomenon that the tubercle bacilli are by no means reabsorbed, nor do they disappear in any way, but for a long time remain unchanged in their position, producing smaller or larger suppurating centres. Thus it was clear that in this method the curative effect on the tuberculous process is obtained by a soluble substance, diffused, so to speak, into the fluids that surround the tubercle bacilli, and transferred without delay to the circulating fluids of the body, whereas that which has the pus-forming quality seems to remain behind in the tubercle bacilli, or at any rate to be only very slowly dissolved. Thus the only important thing to be done was to carry out the process which takes place within the body—*outside* of it also,—and if possible to extract and isolate the curative substance from the tubercle bacilli. This problem required much work and time before at last I succeeded, by the help of a 40 to 50 per cent. solution of glycerine, in extracting the active principle from the tubercle bacilli. My further experiments on animals, and finally on human beings, were made with liquid thus obtained; and in this way also the liquid which I let other physicians have in order to repeat the experiments was obtained. *The remedy with which the new therapeutic treatment of tuberculosis is carried out is, therefore, a glycerine extract of pure cultivations of tubercle bacilli.*

"*The Composition of the Remedy.*—Besides the active principle there pass from the tubercle bacilli into the simple extract all other substances soluble in 50 per cent. glycerine, and therefore there is found in it a certain quantity of mineral salts, pigment, and other unknown extractive substances. Some of these substances can be removed from it without difficulty, for the active principle is insoluble in absolute alcohol, and can be precipitated by it—not pure, it is true, but in combination with other extractive substances likewise insoluble in alcohol. The colouring matter, too, can be separated out, so that it is possible to obtain a colourless dry substance from the extract which contains the active principle in a much more concentrated form than the original glycerine solution. But this purifying of the glycerine extract has no advantages as regards practical application, as the substances thus removed have no action on the human organism, and the process of purifying would, therefore, only cause unnecessary expense. The constitution of the active principle can as yet be only a matter of conjecture. It seems to me to be a derivative of albuminous bodies, and to be in close relation to them, but it does not belong to the group of so-called toxalbumins, as it can withstand high temperatures, and in the dialysator passes quickly and easy through the membrane. The quantity of active principle present in the extract is, in all probability, very small; I estimate it at fractions of 1 per cent. Thus, if my assumption be correct, we have to deal with a substance the action of which on the tuberculous organism far surpasses that of the strongest drugs known.

"*Probable Mode of Action of the Remedy.*—Various hypotheses may, of

course, be formed as regards the specific mode of action of the remedy on tuberculous tissue. Without in any way affirming that my view is the best possible explanation, I imagine the process to be as follows:—The tubercle bacilli in their growth produce in the living tissues—just as in the artificial cultivations—certain substances which have various but always deleterious influences on the living elements of their surroundings—the cells. Amongst these substances is one which, in a certain concentration, destroys living protoplasm and causes it to undergo a transformation into the condition called "coagulation-necrosis" by Weigert. The tissue having become necrotic, this condition is so unfavorable to the nutrition of the bacillus, that it is unable to develop further, and finally in some cases it dies off. In this way I explain the remarkable phenomenon that in organs freshly attacked by tuberculous disease—for instance, in a guinea-pig's spleen or liver filled with grey nodules—numerous bacilli are found, whilst bacilli are rare or entirely absent when the enormously enlarged spleen consists almost entirely of whitish substance in a condition of coagulation-necrosis, such as is often found in guinea-pigs which die of tuberculosis. A solitary bacillus, however, cannot produce necrosis at a great distance, for as soon as the necrosis has reached a certain extent the growth of the bacillus, and, in consequence, the production of the necrosis-producing substance diminishes, and thus a sort of mutual compensation sets in, and to this it is due that the growth of isolated bacilli is so remarkably restricted,—as, for example, in lupus, in scrofulous glands, &c. In such cases the necrosis only extends over a part of the cell, which then, in its further growth, assumes the peculiar form of a giant-cell; I thus follow in this statement of my views the explanation of the growth of giant-cells first given by Weigert. Now, if the necrosis-producing substance were artificially added to that contained in the tissue surrounding the bacillus, then the necrosis would extend further, and thus the conditions of nutrition of the bacillus would be much more unfavorable than is usually the case. Then not only would the more completely necrosed tissue disintegrate, slough, and—where this is possible—take with them the enclosed bacilli, carrying them outward, but the bacilli would also be disturbed in their growth to such an extent that they would die off much sooner than is the case under ordinary conditions. It is in calling forth such changes that, to my mind, the action of the remedy seems to consist. It contains a certain amount of the necrosis-producing substance, of which a correspondingly large dose has a deleterious influence—even in healthy persons—on certain elements of the tissues, probably on the white blood-corpuscles or cells closely related to them, thus giving rise to the fever and the whole peculiar complex symptoms. In tuberculous persons a much smaller quantity suffices to cause, at certain spots—that is, wherever tubercle bacilli vegetate and have already impregnated their surroundings with the necrosis-producing substance—a more or less extended necrosis of cells with the accompanying symptoms affecting the entire organism. In this way it is possible to explain—at least for the present—in a provisional way the specific influence which the remedy in certain well-recognised doses exercises on tuberculous tissue, as well as the possibility of increasing the doses in so remarkable a fashion, and, finally, to explain the curative effect which the remedy undoubtedly possesses where the circumstances are at all favorable.

"*Nature and Physical Characters of the Remedy.*—The remedy is a brownish transparent liquid, which does not require special care to prevent decomposition. For use this fluid must be more or less diluted, and the dilutions are liable to decomposition if prepared with distilled water; bacterial growths soon develop in them, they become turbid, and are then

unfit for use. To prevent this the diluted liquid must be sterilised by heat and preserved under a cotton-wool stopper; or more conveniently prepared with a half per cent. solution of phenol.

"*Manner of using the Remedy.*—It would seem, however, that the effect is weakened both by frequent heating and by mixture with phenol solution, and I have therefore always made use of freshly prepared solutions. Introduced into the stomach the remedy has no effect; in order to obtain a reliable effect it must be injected subcutaneously. For this purpose we have used exclusively the small syringe suggested by me for bacteriological work; it is furnished with a small india-rubber ball, and has no piston. This syringe can easily be kept aseptic by absolute alcohol, and to this we attribute the fact that not a single abscess has been observed in the course of more than a thousand subcutaneous injections. The place chosen for the injection—after several trials of other places—was the skin of the back between the shoulder-blades and the lumbar region, because here the injection led to the least local reaction—generally none at all—and was almost painless.

"*Effect of Injections in Healthy Individuals.*—As regards the effect of the remedy on the human patient, it was clear from the beginning of the research that in one very important point the human being reacts to the remedy differently from the animal generally used in experiments, the guinea-pig—a new proof for the experimenter of the all-important law that experiments on animals is not conclusive for the human being, for the human patient proved extraordinarily more sensitive than the guinea-pig as regards the effect of the remedy. A healthy guinea-pig will bear 2 cubic centimetres and even more of the liquid injected subcutaneously without being sensibly affected. But in the case of a full-grown healthy man 0·25 cubic centimetre suffice to produce an intense effect. Calculated by body-weight the 1500th part of the quantity, which has no appreciable effect on the guinea-pig, acts powerfully on the human being. The symptoms arising from an injection of 0·25 cubic centimetre I have observed after an injection made in my own upper arm. They were briefly as follows:—Three to four hours after the injection there came on pain in the limbs, fatigue, inclination to cough, difficulty in breathing, which speedily increased. In the fifth hour an unusually violent attack of ague followed, which lasted almost an hour. At the same time there was sickness, vomiting, and rise of body temperature up to 39·6° C. After twelve hours all these symptoms abated. The temperature fell until next day it was normal, and a feeling of fatigue and pain in the limbs continued for a few days, and for exactly the same period of time the site of injection remained slightly painful and red. The lowest limit of the effect of the remedy for a healthy human being is about 0·01 cubic centimetre (equal to 1 cubic centimetre of the hundredth solution), as has been proved by numerous experiments. When this dose was used reaction in most people showed itself only by slight pains in the limbs and transient fatigue. A few showed a slight rise of temperature up to about 38° C. Although the dosage of the remedy shows a great difference between animals and human beings—calculated by body-weight—in some other qualities there is much similarity between them. The most important of these qualities is the specific action of the remedy on tuberculous processes of whatever kind.

"*The Specific Action on Tuberculous Processes.*—I will not here describe this action as regards animals used for experiment, but I will at once turn to its extraordinary action on tuberculous human beings. The healthy human being reacts either not at all or scarcely at all, as we have seen, when 0·01 cubic centimetre is used. The same holds good with regard to patients suffering from diseases other than tuberculosis, as repeated ex-

periments have proved. But the case is very different when the disease is tuberculosis; the same dose of 0·01 cubic centimetre, injected subcutaneously into the tuberculous patient, caused a severe general reaction as well as a local one. (I gave children aged from two to five years one tenth of this dose, that is to say, 0·001 cubic centimetre; very delicate children only 0·0005 cubic centimetre, and obtained a powerful but in no way dangerous reaction.) The general reaction consists in an attack of fever, which, generally beginning with rigors, raises the temperature above 39°, often up to 40° and even 41° C.; this is accompanied by pain in the limbs, coughing, great fatigue, often sickness and vomiting. In several cases a slight icteric discoloration was observed, and occasionally an eruption like measles on the chest and neck. The attack usually begins four to five hours after the injection, and lasts from twelve to fifteen hours. Occasionally it begins later, and then runs its course with less intensity. The patients are very little affected by the attack, and as soon as it is over feel comparatively well, generally better than before it. The local reaction can be best observed in cases where the tuberculous affection is visible; for instance, in cases of lupus: here changes take place which show the specific antituberculous action of the remedy to a most surprising degree. A few hours after an injection into the skin of the back, that is in a spot far removed from the diseased spots on the face, &c., the lupus spots begin to swell and to redden, and this they generally do before the initial rigor. During the fever, swelling and redness increase, and may finally reach a high degree, so that the lupus tissue becomes brownish and necrotic in places. Where the lupus was sharply defined we sometimes found a much swollen and brownish spot surrounded by a whitish edge almost a centimetre wide, which again was surrounded by a broad band of bright red.

"After the subsidence of the fever the swelling of the lupus tissue decreases gradually, and disappears in about two or three days. The lupus spots themselves are then covered by a crust of serum, which filters outwards, and dries in the air; they change to crusts, which fall off after two or three weeks, and which sometimes, after one injection only, leave a clean red cicatrix behind. Generally, however, several injections are required for the complete removal of the lupus tissue. But of this more later on. I must mention, as a point of special importance, that the changes described are exactly confined to the parts of the skin affected with lupus. Even the smallest nodules, and those most deeply hidden in the lupus tissue, go through the process, and become visible in consequence of the swelling and change of colour; whilst the tissue itself, in which the lupus changes have entirely ceased, remains unchanged. The observation of a lupus case treated by the remedy is so instructive and is necessarily so convincing that those who wish to make a trial of the remedy should, if at all possible, begin with a case of lupus.

"*The Local and General Reaction to the Remedy.*—The specific action of the remedy in these cases is less striking, but is perceptible to eye and touch, as are the local reactions in cases of tuberculosis of the glands, bones, joints, &c. In these cases swelling, increased sensibility, and redness of the superficial parts are observed. The reaction of the internal organs, especially of the lungs, is not at once apparent, unless the increased cough and expectoration of consumptive patients after the first injections be considered as pointing to a local reaction. In these cases the general reaction is dominant; nevertheless we are justified in assuming that here, too, changes take place similar to those seen in lupus cases.

"*The Diagnostic Value of the Method.*—The symptoms of reaction above described occurred without exception in all cases where a tuberculous

process was present in the organism, after a dose of 0·01 cubic centimetre, and I think I am justified in saying that the remedy will therefore in future form an indispensable *aid* to diagnosis. By its aid we shall be able to diagnose doubtful cases of phthisis; for instance, cases in which it is impossible to obtain certainty as to the nature of the disease by the discovery of bacilli or elastic fibres in the sputum, or by physical examination. Affections of the glands, latent tuberculosis of bone, doubtful cases of tuberculosis of the skin, and such like cases, will be easily and with certainty recognised. In cases of tuberculosis of the lungs or joints which have become apparently cured we shall be able to make sure whether the disease has really finished its course, and whether there be not still some diseased spots from which it might again arise as a flame from a spark hidden by ashes.

"*The Curative Effect of the Remedy.*—Of much greater importance, however, than its diagnostic use is the therapeutic effect of the remedy. In the description of the changes which a subcutaneous injection of the remedy produces in portions of skin changed by lupus I mentioned that after the subsidence of the swelling and decrease of redness the lupus tissue does not return to its original condition, but that it is destroyed to a greater or less extent, and disappears. Observation shows that in some parts this result is brought about by the diseased tissue becoming necrotic even after one sufficient injection, and at a later stage it is thrown off as a dead mass. In other parts a disappearance, or, as it were, a melting of the tissues, seems to occur, and in such case the injection must be repeated to complete the cure.

"*Its Action on Tuberculous Tissue.*—In what way this process occurs cannot as yet be said with certainty, as the necessary histological investigations are not complete. But so much is certain that there is no question of a destruction of the tubercle bacilli in the tissues, but only that the tissue enclosing the tubercle bacilli is affected by the remedy. Beyond this there is, as is shown by the visible swelling and redness, considerable disturbance of the circulation, and, evidently in connection therewith, deeply seated changes in its nutrition which cause the tissue to die off more or less quickly and deeply, according to the extent of the action of the remedy.

"To recapitulate, the remedy does not kill the tubercle bacilli, but the tuberculous tissue; and this gives us clearly and definitely the limit that bounds the action of the remedy. It can only influence living tuberculous tissue; it has no effect on dead tissue, as, for instance, necrotic cheesy masses, necrotic bones, &c., nor has it any effect on tissue made necrotic by the remedy itself. In such masses of dead tissue living tubercle bacilli may possibly still be present, and are either thrown off with the necrosed tissue or may possibly enter the neighbouring still living tissue under certain circumstances. If the therapeutic activity of the remedy is to be rendered as fruitful as possible, this peculiarity in its mode of action must be carefully observed. In the first instance the living tuberculous tissue must be caused to undergo necrosis, and then everything must be done to remove the dead tissue as soon as possible, as, for instance, by surgical interference. Where this is not possible, and the organism can only help itself in throwing off the tissue slowly, the endangered living tissue must be protected from fresh incursions of the parasites by continuous application of the remedy.

"*The Dose.*—The fact that the remedy makes tuberculous tissue necrotic, and acts only on living tissue, helps to explain another peculiar characteristic thereof, namely, that it can be given in rapidly increasing doses. At first sight this phenomenon would seem to point to the establishment of

tolerance, but since it is found that the dose can, in the course of about three weeks, be increased to 500 times the original amount, tolerance can no longer be accepted as an explanation, as we know of nothing analogous to such a rapid and complete adaptation to an extremely active remedy. The phenomenon must rather be explained in this way, that in the beginning of the treatment there is a good deal of tuberculous living tissue, and that consequently a small amount of the active principle suffices to cause a strong reaction; but by each injection a certain amount of the tissue capable of reaction disappears, and then comparatively larger doses are necessary to produce the same amount of reaction as before. Within certain limits a certain degree of habituation may be perceived.

"As soon as the tuberculous patient has been treated with increasing doses for so long that the point is reached when his reaction is as feeble as that of a non-tuberculous patient, then it may be assumed that all tuberculous tissue is destroyed. And then the treatment will only have to be continued by slowly increasing doses and with interruptions, in order that the patient may be protected from fresh infection while bacilli are still present in the organism.

"Whether this conception and the inferences that follow from it be correct the future must show. They were conclusive, as far as I am concerned, in determining the mode of treatment by the remedy, which in our investigations took the following form:

"*The Treatment applied to Lupus.*—To begin with the simplest case, lupus; in nearly every one of these cases I injected the full dose of 0·01 cubic centimetre from the first. I then allowed the reaction to come to an end entirely, and then, after a week or two, again injected 0·01 cubic centimetre, continuing in the same way until the reaction became weaker and weaker, and then ceased. In two cases of facial lupus the lupus spots were thus brought to complete cicatrisation by three or four injections; the other lupus cases improved in proportion to the duration of treatment. All these patients had been sufferers for many years, having been previously treated unsuccessfully by various therapeutic methods.

"*The Treatment applied to Tuberculosis of the Bones and Joints.*—Glandular, bone, and joint tuberculosis was similarly treated, large doses at long intervals being made use of; the result was the same as in the lupus cases—a speedy cure in recent and slight cases, slow improvement in severe cases.

"*The Treatment applied to Phthisis.*—Circumstances were somewhat different in phthisical patients, who constituted the largest number of our patients. Patients with decided pulmonary tuberculosis are much more sensitive to the remedy than those with surgical tuberculous affections. We were obliged to lower the dose for the phthisical patients, and found that they almost all reacted strongly to 0·002 cubic centimetre, and even to 0·001 cubic centimetre. From this first small dose it became possible to rise more or less quickly to the same amount as is well borne by other patients.

"Our course was generally as follows:—An injection of 0·001 cubic centimetre was first given to the phthisical patient; on this a rise of temperature followed, the same dose being repeated once a day until no reaction could be observed. We then rose to 0·02 cubic centimetre until this was borne without reaction; and so on, rising by 0·001, or at most 0·002, to 0·01 cubic centimetre and more. This mild course seemed to me imperative in cases where there was great debility. By this mode of treatment the patient can be brought to bear large doses of the remedy with scarcely a rise of temperature. But patients of greater strength were treated from the first, partly with larger doses, partly with rapidly repeated

doses. Here it seemed that the beneficial results were more quickly obtained.

"The action of the remedy in cases of phthisis generally showed itself as follows:—Cough and expectoration generally increased a little after the first injection, then grew less and less, and in the most favorable cases entirely disappeared; the expectoration also lost its purulent character, and became mucous.

"As a rule, the number of bacilli only decreased when the expectoration began to present a mucous appearance; they then from time to time disappeared entirely, but were again observed occasionally until expectoration ceased completely. Simultaneously the night sweats ceased, the patients' appearance improved, and they increased in weight. Within four to six weeks patients under treatment for the first stage of phthisis were all free from every symptom of disease, and might be pronounced cured. Patients with cavities not yet too highly developed improved considerably, and were almost cured; only in those whose lungs contained many large cavities could no improvement be proved objectively, though even in these cases the expectoration decreased, and the subjective condition improved. These experiences lead me to suppose that phthisis in the beginning can be cured with certainty by this remedy."*

Assuming that by a properly graduated dose the remedy will produce on bovine animals the effects which have been observed on rodents, the value of the test for clinical purposes must be at once apparent. But at present the experiments, owing to the extreme difficulty of obtaining the lymph, have been very few.

A cow at the Royal Veterinary College was recently injected with a dose equal to five times the amount which is administered to the human patient. The dose was repeated in a few days, but no reaction followed, excepting a considerable aggravation of the cough. The temperature did not rise, no swelling of glands occurred, and it must be concluded that the dose was insufficient.

Von Gutmann, of Dorpat, has recently tried the effect of Dr. Koch's lymph on three cows in which tuberculosis was diagnosed from the general symptoms, and finally proved to exist by *post-mortem* examination. On the first experiment the dose 0·1 c.c. was mixed with water 3 c.c., and injected under the skin behind the shoulder. A second cow received a dose of 0·2 c.c. of the lymph diluted, and exhibited in the same way; and a third cow had 0·3 c.c.

All the animals after eleven hours from the time of injection showed some signs of reaction in the rise of tempera-

* "This sentence requires limitation in so far as at present no conclusive experiences can possibly be brought forward to prove whether the cure is lasting. Relapses naturally may occur; but it can be assumed that they may be cured as easily and quickly as the first attack. On the other hand, it seems possible that, as in other infectious diseases, patients once cured may retain their immunity. This, too, must for the present remain an open question."

ture which occurred, but it can hardly be allowed that this can be accepted as a diagnostic sign of the presence of tubercle in cases where there are no distinct indications of the disease. At the present moment it can only be said that there is no proof of the reaction of Dr. Koch's remedy in the case of bovine animals.

Extracts from British and Foreign Journals.

ON THE ACTION OF KOCH'S REMEDY UPON INTERNAL ORGANS IN TUBERCULOSIS.*

By Professor R. VIRCHOW.

"LIMITING his remarks to facts determined by anatomical investigation, Professor Virchow said that from the time at which the practice commenced until the end of December he had examined *post mortem* twenty-one cases in which during life injections of Koch's fluid had been practised, and to these might be added some six or seven more examined during the present year. [A large number also have been examined by his assistants in other hospitals and elsewhere, and have yielded important facts.]

"There is an obvious difference between those cases in which the changes taking place in superficial parts can be observed clinically, and those where the internal organs are affected to an extent difficult to estimate by the most careful clinical investigation; and it is of interest to contrast the latter with the former. Of the twenty-one cases referred to, sixteen were cases of phthisis in the limited sense, *i. e.* in which the lungs were especially involved. The remaining five cases comprised—(1) A well-marked case of tuberculosis of bones and joints; (2) a case presenting the rare concurrence of cancer of the pancreas with small smooth-walled cavities in lung and apical induration; (3) an empyema in a puerperal case, which would probably have proved fatal apart from the injections; (4) pernicious anæmia, with very limited old lesions in lungs and tuberculous pleurisy; and (5) a case of arachnitis tuberculosa. In the remaining sixteen strictly pulmonary cases, all showed more or less extensive phthisical ulceration."

"Reserving for another opportunity a detailed statement

* "Abstract of remarks made during the debate on Dr. B. Fränkel's paper at the Berlin Medical Society, Jan. 7th, 1891. (From full text given in the *Berliner klinische Wochenschrift*, No. 2, 1891.)—*Lancet*

of these cases, Professor Virchow proceeded to make some general remarks on the experience derived from them. Just as observation of external parts had shown that the remedy acts as a severe irritant, exciting redness and swelling, so the same effects had been well seen in the internal parts. He showed a preparation from a case of arachnitis tuberculosa in Henoch's clinic, in which there were also some old caseo-pneumonic areas in the lungs (the probable focus of the meningeal metastasis), together with recent inflammatory changes. After four injections, amounting in all to two milligrammes, the last being sixteen hours before death, the patient (a boy two years and a half old) died. Professor Virchow did not remember ever having seen so 'colossal' a hyperæmia of the pia mater, and even of the brain itself. The pia-matral vessels were extremely distended, and the brain tissue of a dull reddish tint. In this, the only case of the kind in the series, he personally examined the tubercles in the arachnoid, but could detect no degenerative changes in them; they were well formed and of the ordinary character. Similar conditions of acute hyperæmia and swelling were also to be found in other internal organs. They had often noted an unusual deep injection of the granulation layers of old pulmonary cavities—sometimes a hæmorrhagic infiltration of the walls, or evidence of recent hæmorrhage into the cavity. In a man thirty years of age, with an old rectal fistula and numerous tubercular ulcers in the colon, death followed upon hæmoptysis from an old ulcerating focus; he had been injected seven times, the last occasion when the hæmorrhage set in being thirteen days before his death. But these visible changes were not confined to such marked hyperæmic swellings, which obviously might be very transient, for there was not the least doubt that *actual inflammation* with *active proliferation* occurred to a considerable extent. This is well shown at the margins of ulcers and in the neighbouring lymphatic glands, especially the bronchial and mesenteric. The glands were most markedly swollen, that form of medullary swelling peculiar to acute irritation and due to a rapid proliferation of the cells within the gland. This change is often associated with obvious leucocytosis, which may be assisted by the infiltration of white blood-corpuscles around the tubercle. Sometimes these inflammatory swellings are dangerous. Thus in the larynx, although the ulcers may become healthier, the neighbouring tissue enormously swells, and may produce a critical degree of stenosis. Sometimes the change may assume a

phlegmonous type, comparable to what is seen in œdema of the glottis and retro-pharyngeal abscess, as illustrated in a case seen this month (January). No doubt it is difficult to assert that any such inflammation is due to the injections, for there is no criterion for any differentiation; nor was he prepared to say precisely how this kind of inflammation may be recognised and distinguished from other inflammatory lesions arising in the course of phthisis. But in the lungs certainly there are lesions which are exceptionally peculiar.

"Among the fatal cases of ulcerative phthisis the great majority showed wide-spread changes of recent date, mostly in the lungs, but also associated with pleurisy of very severe type, simple and tubercular, hæmorrhagic and not rarely bilateral. The lung changes may be separated into two seemingly very different categories. The one corresponds to what is styled 'caseous pneumonia,' or anatomically, 'caseous hepatisation.' It might be thought very doubtful whether this change was in any way connected with the injections. Professor Virchow would himself have doubted this were it not that some of the cases showed it in a special degree, and he exhibited a portion of lung which had undergone caseous hepatisation to an extent the like of which he had not seen for years. The lungs were large, their lower lobes, especially the right, as voluminous as in ordinary hepatisation; but the foci were so thickly massed as to leave hardly any parenchyma between them. It was like a piece of black sausage richly laden with fat. The non-caseous parts were blackish and sharply demarcated from the caseous. The man was thirty-three years old; he had had six injections, the last four weeks before death, and the injections were suspended because of supervention of continued fever and infiltration of the lower lobes. This infiltration started just after the injections, for previously there were only signs of induration at one apex, where was afterwards found an old indurated focus. In other cases, also, the condition of the lungs similarly differed from what is usually seen in phthisis; in five of the cases there were more or less large masses of caseous hepatisation, but not approaching the extent of the case related.

"Another change, which is certainly inflammatory, is of a more diffuse character, although again not absolutely distinctive. The types of pneumonia liable to arise in the course of phthisis may be placed in three different categories. There are the caseous, the ordinary fibrinous, and the *catarrhal*, so-called smooth pneumonias—marked essentially

by cell accumulations in the alveoli. One may see all these forms in a case of phthisis, but in not one of the injected cases was simple fibrinous pneumonia present (semi-fibrinous hepatisation occurred associated with other changes). In fact, the 'injection pneumonia' resembles the catarrhal type, but with certain differences. Catarrhal pneumonia, as ordinarily met with in phthisis, exhibits a moderately fluid collection in the alveoli, which can only be slightly expressed from them. Sometimes the contents are much more watery, like brine, and it was this which led Laennec to speak of gelatinous infiltration preceding tubercular infiltration. But the product in these cases is not gelatinous; it is rather watery and turbid; it might be called cloudy infiltration, and calls to mind a *phlegmonous* condition. In some parts it is more opaque; in parts it has a superficial likeness to caseation, but without its dry character, and there is no difficulty in distinguishing the two. The catarrhal phlegmonous condition is softer, moister, and laxer, as in a specimen shown, where around large ulcerating cavities in the apex of lower lobes were caseous masses and catarrhal inflammation. Two other specimens also showed caseous and catarrhal hepatisation, which condition occurred in seven out of the sixteen cases examined last year. A further point of difference from ordinary catarrhal hepatisation consists in the occasional occurrence of areas of softening in the midst of the hepatised foci, producing rapid excavation; for instance, in the middle of the lower lobe, just as in gangrenous broncho-pneumonia. This result seems to point to the operation of a stronger irritant than that which is usually regarded as the cause of catarrhal pneumonia. Professor Virchow is of opinion that, in some of these cases at least, the inflammatory processes are analogous to those excited in the external parts after injection, which vary in intensity with the individual and the special features of the case.

"Another phenomenon has been noted which requires confirmation by thorough clinical observation; it is the outbreak of *recent tubercles* in these patients. He could only speak with much reserve on this point, since we have no fixed data as to the duration of small tubercles—*i. e.* the *submiliary form*—and cannot judge positively as to their age. Generally they are regarded as being of recent formation. Clinical observation in certain cases has shown an eruption of tubercles on the laryngeal mucous membrane after injection. Small tubercles have become almost suddenly visible in places which appeared to be perfectly free from

them, and they have rapidly given rise to fresh ulcers. It is asserted that this shows the tubercles to have existed prior to the injection, but that they have not been visible. They have been attacked and destroyed by the remedy, and thereby changed into ulcers. Professor Virchow was unable to controvert this statement as regards the recorded cases, but in his own examination of those parts, which he has always regarded as most suitable for the observation of these recent formations—viz. serous membranes—has revealed *the eruption of very recent tubercles under conditions which render it very unlikely that these were of old date.* This is especially seen in the pleura, pericardium, and peritoneum. He has never been able to confirm the notion that the tubercles were strongly attacked by the remedy and mortified, for in all these cases the submiliary tubercles in question were quite intact, even following injections made some weeks previously. Hence he is the more inclined to the notion that their eruption first took place *after* the injection.

"Owing to the great difficulty in discriminating precisely these very fine forms of tubercle in the lungs themselves, he would speak only of regions, such as the mucous membrane of the larynx, where miliary tubercles first appeared after injection, or where after more prolonged injections quite recent tubercles have been seen in the membrane. He showed an intestine—procured this month—in which there was a very recent submiliary eruption in the vicinity of old ulcers; the patient, a man forty-one years old, also had recent tubercles in the pericardium.

"In endeavouring to explain these fresh eruptions he remarked that if one admits that every tubercle is due to bacilli, the study of such remote parts as the pericardium deserves special attention. In another case the epicardium had at one spot, not in contact with the affected part of the lung, a small group of four such miliary tubercles surrounded by marked hyperæmia. There seemed no other explanation than that their germs had come there by metastasis; and why, he asks, should not the metastatic transference of liberated bacilli be deemed a source of more generalised infection? For Professor Koch states that the bacilli resist the action of the remedy, nor indeed are they destroyed, and therefore the possibility must be recognised that the softening process excited by the remedy makes the degenerative products more fluid and more liable to be carried away to create foci elsewhere. This idea is not far-fetched, and is linked with another, viz. the infiltration, under the treat-

ment, of a whole lower lobe into foci of caseous hepatisation, suggesting that material set free from the upper lobe by the destructive processes, and not coughed up, has been sucked into the lung and has excited a kind of caseous 'Shluck-pneumonia.'

"Professor Virchow said he felt bound to express these ideas in order to unite with them the warning that still greater caution should be used in operating on cases where the patient has not the strength or the habit of completely coughing up the softened material, and where there is great possibility of the conveyance of this material to other parts of the lung to excite therein fresh foci. Another point on which Professor Koch lays stress as the main effect of his remedy is the destructive process itself. There is no doubt that such an action does take place in many parts; but it is not quite clear why this mortification does not always occur, as, for instance, in the cases of submiliary tubercles referred to. Professor Virchow admitted—as had been described by some earlier observers—in tubercular pleurisy, for instance, that, especially when the tubercles increased in size, they assume an unusually cloudy, yellowish aspect, and show definite microscopic changes. But at other times, even when injections are continued to the day before death, this change does not occur. Large tubercles may even appear very resistent. They had lately a very remarkable case of a boy three years of age, with tuberculosis of the vertebræ and long bones, and where large tubercles were found in the brain. The injections had reached 0·012 gr. It was a surgical case, in which spinal caries with psoas abscess and much disease of the joints and bones of the lower limbs existed. At the necropsy there were as many as seven so-called 'solitary tubercles'—*i. e.* large caseous masses—in the brain and cerebellum; but neither in them nor in their vicinity were any marked changes to be seen. There were a few spots of softening, but not of special import, and certainly none of the nodules showed any marked destruction.

"Professor Virchow next drew attention to the conditions observed in cases of phthisis, in *ulcers of the intestine* and in the *ulcers of the respiratory organs, especially in the lungs.* As regards the intestine, there could be no question as to the occurrence of mortifying processes similar to those observed in lupus, especially in the older ulcers of wide extent and thickened margins, where there is much fresh submiliary eruption to be seen together with extreme mortification. He showed the specimen from the case which also had pericardial tubercle, in which the destruction

of the intestinal ulcer had invaded the serous coat. Had the man survived two days longer perforation must have occurred. This was so in another case lately related by Professor B. Fränkel, where death occurred from perforation. Although such mortification and perforation do take place in tubercular ulceration, yet it was remarkable to have two such instances within two months of severe cases where the mortifying process was in rapid progress. The same is true of ulcers in the organs of respiration, in which very rapid destruction takes place, and the unusually large size of the detached masses must obviate the possibility of their being expectorated, and thereby favour their retention and aspiration with its consequences. Professor Virchow showed also a specimen of very severe laryngeal tuberculosis (from the same case as the pericardial and intestinal specimens referred to) in which twenty injections had been practised, the last on the day preceding death. The specimen showed a recent eruption involving the whole extent of the larynx, of most exceptional severity. Another preparation showed recent caseous hepatisation, from a case in which six injections were made, the last four days before death; another where three injections, the last one week and a half before death, and in which cheesy foci and tracts of diffuse inflammation were present; and lastly, a preparation obtained that morning showing a spreading abscess in the lung starting from bronchiectasis in the lower lobe."—*Lancet.*

Pharmacy and Therapeutics.

BINOXIDE OF NITROGEN.

Reference was made in our contemporary the *Lancet* (April 10th, p. 709, 1886) to the discovery of binoxide of nitrogen as a disinfectant and germicide by a Spanish professor. It had been a noticeable fact that none of the workmen in an electrotyping establishment in Madrid died from cholera during the epidemics of 1834, 1859, and 1865, only those who frequently absented themselves from the factory being attacked at all. Since then further investigations have been made, and the disinfecting powers of the binoxide of nitrogen are fully demonstrated by the fact that liquids from dead bodies when treated with the compound soon lose their peculiar smell and remain free from micro-organisms.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JANUARY 7TH, 1891.

Professor McCall, President, in the chair.

Present:—Dr. Fleming; Professors Axe, Penberthy, Pritchard, Walley, Williams; General Sir Frederick Fitzwygram; Sir Henry Simpson; Messrs. J. D. Barford, J. Roalfe Cox, W. Hunting, H. Kidd, J. Malcolm, W. Mulvey, R. Rutherford, J. F. Simpson, R. C. Trigger, W. B. Walters, F. W. Wragg, G. Thatcher (Solicitor), and A. W. Hill (Secretary).

The *Secretary* read the notice convening the meeting.

Absentees.

The *Secretary* stated that the following gentlemen had written expressing their regret at being unable to attend the meeting:—Messrs. Cartledge, Whittle, Taylor, Briggs, Lambert, and Greaves.

On the motion of *Dr. Fleming*, seconded by *Professor Williams*, the minutes of the previous meeting were taken as read and confirmed.

Presentations.

The *Secretary* announced the following presentations to the library:—From Mr. W. T. Kendall, copies of the 'Veterinary and Live Stock Journal' of July and October, 1890; and 'Proceedings of the Eighth Special Meeting of the National Veterinary Association;' 'Rabies and Muzzling,' by Mr. T. B. Goodall; 'The Journal of the Royal Agricultural Society of England,' and the 'Catalogue of the Harvard University.'

Correspondence.

The *Secretary* read letters from Mr. Greaves; Mr. Lambert, of the Army Veterinary Department; from the Solicitor, in regard to the Electric Lighting Company; and he also read the correspondence with reference to the Harvard University, having regard to its recognition.

On the motion of *Dr. Fleming*, seconded by *Sir Henry Simpson*, the correspondence from the Harvard University was referred to the Foreign and Colonial Schools Committee.

Election of Honorary Associates.

The *Secretary* stated that the following gentlemen were proposed as Honorary Associates at the last quarterly meeting, and that their names had been suspended in the usual way for three months:—M. Neuman, of the École Vétérinaire, Toulouse; Mr. W. P. Kendall, of Melbourne; and Mr. Nocard, of the École Médecine Vétérinaire.

Mr. J. F. Simpson moved that the signatures be attached to the diplomas proposed to be given to the three gentlemen mentioned.

Professor Walley seconded the motion, which was agreed to.

Finance Committee.

The *Secretary* read the report.

Mr. F. W. Wragg moved that the report be received and adopted, and that the Treasurer be empowered to draw cheques to meet the outstanding liabilities.

Dr. Fleming seconded the motion, which was carried.

Registration Committee.

The *Secretary* read the report.

On the motion of *Mr. Mulvey*, seconded by *Professor Pritchard*, it was resolved that the necessary authority be given to the Solicitor to prosecute in the cases mentioned in the report.

Other matters referred to in the report were adjourned, the necessary quorum of the Council not being present.

Parliamentary Committee.

The *Secretary* stated that the Sub-committee with regard to the Charter had met, but had yet to report to the Committee which appointed it; so that their work was not then complete to bring before the Council.

General Purposes Committee.

The *Secretary* read the report.

On the motion of *Mr. Mulvey*, seconded by *Mr. Trigger*, the recommendation in the report was referred back to the General Purposes Committee.

Committee in re *Koch's Discovery.*

The *Secretary* stated that he had written to the Veterinary Colleges in Russia, Germany, France, Italy, Belgium, and Austria, and had received four letters in reply. The Committee met on the 6th January, and reported that it was desirable to enter upon a course of experiments on the lower animals, with a view of testing the diagnostic and therapeutic value of Koch's fluid; that such experiments be conducted at the Veterinary Colleges of London and Glasgow; that a member of the profession be dispatched to Berlin with all the necessary letters of introduction for the purpose of obtaining the fluid, and that Mr. Raymond be asked to undertake the mission.

Mr. Mulvey asked if any definite sum was going to be fixed for Mr. Raymond's expenses.

Professor Walley asked if there was any possibility of obtaining the lymph through the British Consulate.

The *President* said it was thought that an application through a member of the profession might be more likely to succeed.

Mr. J. F. Simpson did not think it was necessary for the Council to adopt the report. The matter had been referred to a special committee with power to act.

Professor Pritchard said the money was voted to scientific uses, and not to that particular matter.

Professor Williams thought the matter might be left in abeyance. The lymph by-and-by would be manufactured

wholesale by the German Government, and until that was done it would be a very difficult matter to get it.

Professor Walley said that, when the subject was first brought forward, he wrote a letter to the effect that he thought the matter premature. He did not oppose the movement, but it appeared to him that the idea of adopting that principle for the cure of tuberculosis was absurd. It had now come to be a question of diagnosis, and not of cure at all.

Sir Henry Simpson said he thought Professor Pritchard was under a misapprehension. Two resolutions were proposed and sent out on the agenda paper. The first, which was that a sum of £250 should be voted, was carried; and the second resolution was adopted in the following form:—"In pursuance of the resolution regarding the treatment of tuberculosis in animals, the Council do forthwith ballot for a Committee of seven, including the President, who is not to be balloted for, to carry out the foregoing resolution with full power to act." That resolution was unanimously agreed to.

Mr. Hunting said it was clear that there was some misunderstanding. He proposed that the report of the Committee be not adopted; and, as they seemed to have the power of doing as they chose, that the Council request them to postpone action until some future time.

Sir Henry Simpson said it was useless for the Council to stultify itself. There was no question that what was done was in order. The Council knew very well what they were voting about. They had balloted for a Committee of seven with full power to act. That Committee had been called together, and of course intended to act.

Professor Walley asked how it was that only two Colleges had been chosen at which the experiments were to be carried out. He did not see why the other Colleges should not be included.

The *President* said that on the previous occasion no one was present representing the other Colleges.

Sir Henry Simpson said that an application from any of the other Colleges of Great Britain sent to the Committee would, of course, be entitled to equal consideration. The Committee were empowered by the Council to do certain things, and they had thought proper to send in the report that they had. The Council having delegated the power to the Committee could not go behind it. He did not believe that the Council had any right to pass such a resolution as that proposed by Mr. Hunting, or that the Committee had any right to recognise it. The resolution could not be legally passed, and if it were passed the Council was stultifying itself.

Mr. Hunting said he would withdraw his motion, having protested against the action taken.

Mr. J. Roalfe Cox proposed that the names of all the Principals of the Colleges be added to the Committee.

Mr. Kidd seconded the motion, which was carried.

Professor Williams, in replying to Sir Henry Simpson's observations, maintained that what the Committee did could not only be reviewed by the Council, but that it could be put a stop to altogether. It was the Council that had delegated their power to the Committee, and if the action of the Committee did not meet with their approval, certainly they could withdraw that power.

Mr. J. Roalfe Cox said that, with reference to the full power of the Committee, he was perfectly convinced that nothing could be done by them without submitting it previously to the Council.

Committee in re *Bursary to Students.*

The *Secretary* read the report.

Mr. Trigger moved the adoption of the report.

Mr. J. Roalfe Cox seconded the motion.

Professor Walley moved as an amendment—"That £75 be given annually to assist graduates to prosecute their scientific studies."

The amendment not being seconded, the motion for the adoption of the Report was agreed to.

Mr. Hunting thought that some answer ought to be given to the Central letter. He moved that the Council accept the offer, and instruct the Secretary to acknowledge it with thanks. The grant was limited by the letter to anatomy, and it was for the Council to say whether they would accept the gift with any such limit. He did not think the Central Veterinary Medical Society tied themselves to anatomy, and he also thought that they would be very glad to hear any suggestion from the Council for the use of the £50. He moved that such a reply be sent.

Mr. Trigger seconded the motion.

Mr. J. F. Simpson moved as an amendment—"That a letter be written asking the Society if they could see their way to withdraw the condition with regard to anatomy."

Dr. Fleming seconded the amendment.

Mr. Mulvey thought the Council might rest assured that there was no wish on the part of the Society that it should be limited to anatomy. It was simply a suggestion emanating from some of the members.

Mr. Trigger said he should be very sorry if there were a division. He thought it would be just as well to adopt Mr. Simpson's suggestion.

Mr. Wragg said he felt sure that the Council of the Central would fall in with any suggestion made by this Council. There were four members of that Council present.

The amendment was then put and agreed to.

Court of Examiners.

Mr. Hunting said that the agenda paper stated that they were to have a report from the Court of Examiners; he should like to see the report.

The *Secretary* said the report was drawn up in the usual way.

Mr. Hunting said that the Charter and the Bye-Laws stated that the Court of Examiners should submit a report. He wanted to know where the report was.

Sir Henry Simpson said the report stated the number of those who had passed, those who had passed with credit, and those who had passed with very great credit.

Mr. Hunting.—Who is the representative of the Court of Examiners?

Sir Henry Simpson.—The Examining Board.

Mr. Hunting.—Is there any signature to the Report?

Sir Henry Simpson.—The record sheets are all in the possession of the Council.

Mr. Hunting.—That is not a report.

Sir Henry Simpson said that a report was compiled and presented. Hitherto no other report had been asked for. He should think the Board of Examiners would be only too glad to give any report which was required.

The *Solicitor* said all the Bye-law stated was that a list of the successful candidates at each examination, signed by the Chairman of the Court, should be transmitted to the President.

Mr. J. Roalfe Cox said that there had been a certain custom observed; and he proposed that the Council furnish the form of report which it required to be delivered by the Examiners after each examination, with instructions thereon, to the Board from time to time. He had purposed giving that notice of motion, but now would be the opportune time to do so.

Mr. Rutherford said that since he had held the post of Secretary in Scotland he had been in the habit of sending in a very full report.

Mr Kidd said that since he had been on the Council he had never seen a report from the Court of Examiners.

Dr. Fleming said that that Examining Board was composed of a number of sections, and each section had its chairman. The chairman submitted to the secretary the names of those who had passed, and he believed those names were submitted to the Council. If any special report were required, it was for the Council so to rule. Hitherto no form had been required, except that from the formation of the College it had been the custom for the names of those who had passed to be read. The Council had never asked at any time for any special report.

The *President* observed that the record sheets were open for inspection.

The *Secretary* read the report and record sheets, from which it appeared that the number of students that had passed the various Colleges were as follows:—Class C, Final, 56; Class B, Final, 49; Class A, Final, 42.

Professor Walley suggested the appointment of reserve examiners.

Mr. Kidd moved the reception and adoption of the report of the Court of Examiners, but that it be not published.

Professor Walley seconded the motion.

Dr. Fleming said he was not aware that the present report was in any way different from the reports of former years.

Mr. Hunting contended that reports should be forwarded by the examiners. The report which had been read from Mr. Rutherford was of itself sufficient evidence of the necessity of such reports. Little complaints were heard unofficially, but if they had a written report from the examiners they would come before the Council in a proper manner, and could be dealt with. The Council ought to know how the students had acquitted themselves, and whether any subject might be improved or omitted. All those things could only be gone into by having a proper written report from the Board of Examiners.

Sir Henry Simpson testified to the cordiality and kind feelings which had always existed between the Principals of the schools and the Board of Examiners.

General Sir Frederick Fitzwygram said he thought it would be desirable that the Council should express its wish that in future a detailed report should be sent from London. It was his opinion that all the specimens ought to be prepared by the examining body, and not received from the schools where the students were examined.

The motion for the adoption of the report was agreed to.

Mr. Hunting moved—"That it be an instruction to the Court of Examiners to furnish, through their Chairman, a report to the Council of each examination, stating the names of the men who have passed, the standard attained in each subject, and other matters which may be considered necessary."

Dr. Fleming said that that was done at present.

Mr. Hunting said that if that were so he would ask for any report that had been furnished to the London section for the last ten years to be produced.

Professor Axe seconded Mr. Hunting's motion.

The *Solicitor* pointed out that if it were to be an instruction the Court of Examiners were not bound to carry it out. The Charter said nothing about a report at all. It simply allowed examinations to take place, and the bye-law said what was to be done.

Mr. Hunting then withdrew his motion.

The Fellowship Degree.

The *Secretary* read the report of the Court of Examiners for the Fellowship Degree, which stated that the Degree had been conferred upon Professor Shave, R.V.C., Mr. H. C. Wilkie, of Bodmin, Cornwall, Mr. T. A. Hubbard, of Cheltenham, and Mr. F. G. Ashley, of Bath.

The report was adopted.

Mr. Rutherford moved—"That the name of the Scotch Secretary having a position on the Examining Board be placed upon the Register."

Professor Pritchard seconded the motion, which was agreed to.

The *Secretary* read the obituary list.

On the motion of *Sir Henry Simpson*, seconded by *Mr. Walters*, it was resolved—"That the dates for the examination of students shall be fixed by the Council at the quarterly meetings in April and October in each year."

The following notice of motion was given by *Mr. J. Roalfe Cox*:—"To consider a suggestion to introduce post-graduate courses of instruction by lectures, demonstrations, and microscopic work in connection with veterinary sanitary science and public health; and the introduction of an examination annually by the Royal College of Veterinary Surgeons, amongst other things, on the inspection of animals, living or dead, affected with disease which is communicable, or may be suspected to be communicable, to mankind, and the inspection of the flesh and milk of animals so affected, and the general appearance and the microscopic changes therein rendering the consumption objectionable for human food; and the granting of a certificate of special qualification for appointments to the office of inspectorship."

The meeting was then made special for the purpose of considering the adoption of the revised Regulations for the Examination of Students in General Education.

Professor Axe moved—

1. Students who enter the Veterinary Schools shall, prior to their first Professional Examination by the Royal College of Veterinary Surgeons, undergo an examination in the undermentioned subjects, or produce a certificate of having passed one of the following examinations:
   - (1) For Matriculation, or any higher examination for degrees, or one of the "Local Examinations" held by a university in the United Kingdom, or by a colonial or foreign university recognised by the Council of this College.
   - (2) For the Certificates of the First Class or First Division of the Second Class granted by the College of Preceptors.
   - (3) An examination recognised by the General Medical Council as exempting candidates from the Preliminary Literary Examinations of the various medical corporations, or a certificate of examination by the Incorporated Law Society, or the Preliminary Examination of the Pharmaceutical Society.
   - (4) (i) Intermediate Education Board of Ireland, Senior or Middle Grade; (ii) Apothecaries' Hall, Ireland; (iii) Military, Naval, Civil Service, Marine, and Divinity—any part of the United Kingdom.
2. Students who do not produce one or other of the certificates referred to shall be examined by a Board of Examiners

appointed by and under the direction and supervision of this College, the examination shall be uniformly applicable to the whole of the United Kingdom, and the result of the same shall be reported to the Council. The nature and extent of this examination shall be fixed by the Council from time to time. It will be of two classes of subjects—one obligatory and the other optional.

The following are the subjects of examination:

PART I.—*Obligatory Subjects.*

1. Reading aloud.
2. Writing from dictation.
3. English grammar, with parsing and composition.
4. Arithmetic—the simple and compound rules, with vulgar and decimal fractions.
5. Either outlines of English history or geography of Europe and the British Isles.
6. The following foreign languages:
   Latin.—First Book of 'Cæsar's Commentaries,' or an alternative "unseen" paper;

and either—

(*a*) French (no set book) or
(*b*) German, ditto.

PART II.—*Optional Subjects.*

1. Euclid—Book I, or the subjects treated therein.
2. Algebra to quadratic equations.
3. Natural history, zoology, botany, physiology (one branch only).
4. Inorganic chemistry.
5. Mechanics.
6. Any of the specified foreign languages not taken as obligatory.

That these regulations shall come in force on and after the 1st September, 1891.

Dr. Fleming seconded the motion.

Professor Walley said that the first section stated, "a colonial or foreign university recognised by the Council of the College." In order to avoid such difficulties as had arisen in the past, might it not be as well to define what was meant by recognising, and what was meant by not recognising? There were the whole of the colonial and foreign universities, and how did they know that they might not be bogus universities?

Professor Penberthy thought it had been decided that until any College was specified by the Committee it should not be recognised. Some of the examinations which he saw specified did not contain their obligatory subjects, and men might come in without doing one, two, or three of those subjects.

Professor Walley said there was one degree which apparently had not come under the cognizance of the Committee, namely,

the Government Leaving Certificate of the Educational Department of London. It was accepted by all the medical corporations, and he thought it ought to be included.

Mr. Trigger thought that instead of adding to the list it would be well to strike out everything except the first and second resolutions.

Sub-sections 1, 2, 3, and 4 having been adopted,

Mr. Walters moved the addition to the list of "the Government Leaving Certificate of the Educational Department of London, provided on inquiry it was found to cover all the obligatory subjects."

Professor Walley seconded the motion.

Mr. Hunting moved as an amendment that the list remain as it stood.

Mr. J. F. Simpson seconded the amendment, which was carried.

Professor Penberthy moved the addition of the rider—"Provided that all these examinations include the obligatory subjects as laid down by the Royal College."

Mr. Mulvey seconded the resolution, which was agreed to.

On the motion of *Professor Walley*, seconded by *Professor Williams*, Section 2 was agreed to.

On the motion of *Professor Williams*, seconded by *Mr. J. F. Simpson*, the first five obligatory subjects were agreed to.

Professor Walley moved the acceptance of No. 6.

Mr. Trigger seconded the motion.

Mr. Hunting proposed as an amendment, unless the optional subjects were done away with — "That Latin, French, and German be put into the optional subjects, and that any one of those subjects might be adopted, in which case he would increase the severity of the Latin examination by making it the first two books of Cæsar, or by simply making it an 'unseen' paper."

Professor Williams wished No. 6 to read as follows:—"The following foreign languages, either Latin, French, or German," and he moved an amendment to that effect.

Mr. Trigger observed that at the annual meeting there was a strong majority in favour of Latin being made obligatory.

Professor Walley said that if Professor Williams put his proposition he would drop his motion.

Professor Axe thought it would be most unfortunate if Latin were not made an obligatory subject.

The resolution adopting No. 6 was then put and agreed to.

Mr. Hunting moved that the whole of "Part II, Optional Subjects," be deleted.

Mr. Malcolm moved that Nos. 1 and 2, "Euclid, Book 1, or the subjects treated therein; Algebra to Quadratic Equations," be added to the obligatory subjects. This was not seconded.

Professor Walley said that the optional subjects as they were were misleading. Students were constantly writing asking what was their use.

Professor Axe moved—"That Part II, Optional Subjects," stand as it was, adding the following rider:—"That a record be published after each examination indicating the intending students who have passed the optional subjects, and what those subjects are." The resolution was agreed to.

Professor Axe moved—"That Regulation 17 of the Regulations for Professional Examinations be altered by striking out the words 'twelve months' on the sixth line thereof, and by substituting the words 'three years' in place of the words so struck out."

Professor Williams seconded the motion, which was agreed to.

On the motion of *Sir Henry Simpson*, seconded by *Professor Penberthy*, it was resolved—"That Bye-law 48 be altered by adding to the investments authorised for the funds of the College, mortgages on real securities in England or Wales, or on heritable property in Scotland, or on bonds, mortgages, or debentures of incorporations or incorporated companies paying dividends on their ordinary stock, in accordance with Section 17 of the Charter of 1876, and the Trusts Investment Acts."

Professor Walley withdrew the following resolution, of which he had given notice of motion:—"That the present period of study be extended by the addition of at least three terms." He then moved—"That the examination in Materia Medica be rendered more strict than it is at present, and that it shall include Practical Pharmacy; and that the time of the Practical Examination of students be extended."

Professor Williams thought that so far as materia medica was concerned there was plenty of time to examine upon it. Practical pharmacy was an important subject, and they might be justified in going to the expense of adding another examiner to the practical examination.

Sir Henry Simpson thought they might wait at present and see if anything was done by the new Charter with a view to compulsory pupilage.

Mr. Rutherford said that if practical pharmacy was included they must have separate tables, which would mean another scale of fees, as it would be doing an injustice to put more work on the examiners without their receiving additional pay.

The *President* thought they might very well go on as they were.

Professor Walley said he should be quite content to let the matter stand over till they could do something with reference to the increase of examiners.

The motion having been withdrawn,

Professor Walley moved—"That the marks to be obtained by students in the Matriculation Examination shall be 50 per cent. in reading and in writing to dictation, and 30 per cent. in all other subjects."

Mr. Trigger seconded the motion, which was carried.

On the motion of *Mr. Trigger*, seconded by *Mr. J. F. Simpson*, it was resolved—"That it be an instruction to the examiners

that the time allowed for the Practical Examination of students be extended."

Notices of Motion.

Mr. Hunting gave notice of motion for the alteration of Bye-law 31—"That this bye-law be altered so far as the first three lines, ending at the word 'President.' 'A report of each examination, signed by the Chairman of each section, shall be transmitted to the President and Council stating the names of successful candidates, the general standard of excellence attained in each subject, and referring to any other matters which it is desirable should be notified by Council.'"

General Sir Frederick Fitzwygram gave the following notice of motion:—

"(1) That the Quarterly Meetings be held on fixed days.

"(2) That special meetings shall not be summoned except on occasions of most urgent necessity.

"(3) That thirty minutes instead of twenty minutes be allowed to each student at each table at the Final Examination, and also at the Practical Examination for horses, and the same for cattle.

"(4) That no more than eighteen candidates be examined in one day at any table in the First and Second Examinations; nor more than twelve in the Final Examination."

Mr. F. W. Wragg gave notice of motion—"That a chartered accountant be appointed to audit the accounts of the College, and to prepare the annual balance-sheet.

A vote of thanks was accorded to the President, and the Council adjourned.

SPECIAL MEETING OF COUNCIL, HELD JANUARY 20TH, 1891.

Present:—Dr. Fleming; Professors W. Axe and Pritchard; Messrs. J. D. Barford, J. Roalfe Cox, Hunting, Mulvey, R. Trigger, Walters, Wragg, G. Thatcher (Solicitor), and A. W. Hill (Secretary).

On the motion of *Mr. Barford*, seconded by *Mr. Trigger*, Dr. Fleming was voted to the chair.

The *Secretary* read the notice convening the meeting.

On the motion of *Mr. Mulvey*, seconded by *Mr. Barford*, the minutes of the previous meeting were taken as read and confirmed.

Absentees.

The *Secretary* announced that letters regretting inability to attend had been received from Professor McCall, Mr. Briggs, Mr. Malcolm, and Mr. P. Taylor.

Correspondence.

The *Secretary* read a letter from Professor McCall expressing the opinion that Latin should be taken in the obligatory subjects in the new bye-laws, without either French or German being mentioned.

The *Secretary* was instructed to write to the President to the effect that Latin had been passed at the last meeting as an obligatory subject, and either French or German.

Confirmation of New Bye-laws and Regulations.

The confirmation of the following passed at a special meeting held on the 7th of January came up for consideration.

Regulations for the Examination of Veterinary Students in General Education.

1. Students who enter the Veterinary Schools shall, prior to their first Professional Examination by the Royal College of Veterinary Surgeons, undergo an examination in the undermentioned subjects, or produce a certificate of having passed one of the following examinations:
   (1) For Matriculation, or any higher examination for degrees, or one of the "Local Examinations" held by a university in the United Kingdom, or by a colonial or foreign university recognised by the Council of this College.
   (2) For the Certificates of the First Class or First Division of the Second Class granted by the College of Preceptors.
   (3) An examination recognised by the General Medical Council as exempting candidates from the Preliminary Literary Examinations of the various medical corporations, or a certificate of examination by the Incorporated Law Society, or the Preliminary Examination of the Pharmaceutical Society.
   (4) (i) Intermediate Education Board of Ireland, Senior or Middle Grade; (ii) Apothecaries' Hall, Ireland; (iii) Military, Naval, Civil Service, Marine, and Divinity—any part of the United Kingdom; provided that all these examinations include the obligatory subjects as laid down by the Royal College.
2. Students who do not produce one or other of the certificates referred to shall be examined by a Board of Examiners appointed by and under the direction and supervision of this College, the examination shall be uniformly applicable to the whole of the United Kingdom, and the result of the same shall be reported to the Council. The nature and extent of this examination shall be fixed by the Council from time to time. It will be of two classes of subjects—one obligatory, and the other optional.

The following are the subjects of examination :

PART I.—*Obligatory Subjects.*

1. Reading aloud.
2. Writing from dictation.
3. English grammar, with parsing and composition.
4. Arithmetic—the simple and compound rules, with vulgar and decimal fractions.
5. Either outlines of English history or geography of Europe and the British Isles.
6. The following foreign languages :

   Latin.—First book of Cæsar's Commentaries, or an alternative "unseen" paper;

and either—

(*a*) French (no set book) or
(*b*) German, ditto.

PART II.—*Optional Subjects.*

1. Euclid—Book I, or the subjects treated therein.
2. Algebra to quadratic equations.
3. Natural history, zoology, botany, physiology (one branch only).
4. Inorganic chemistry.
5. Mechanics.
6. Any of the specified foreign languages not taken as oligatory.

That a record be published after each examination indicating the intending students who have passed the optional subjects, and what those subjects are.

That the marks to be obtained by students in the Matriculation Examination shall be 50 per cent. in reading and in writing to dictation, and 30 per cent. in all other subjects.

That these regulations shall come in force on and after the 1st September, 1891.

Mr. Mulvey said that with reference to the latter part of Clause 4, "provided that all these examinations include the obligatory subjects as laid down by the Royal College," he fancied that some of the certificates that were mentioned did not include "reading aloud," and "writing from dictation." He thought it would be as well if those words were altered somehow; it might be put "of equal value with the certificates of." As it was, some good certificates would be excluded if they did not mention "reading aloud" and "writing from dictation."

The *Chairman* thought they could not alter the wording at that meeting, as they were only there to confirm the resolutions. The new regulations must be either accepted or rejected. The best way was to pass them, and then if Mr. Mulvey wished to alter them, to give notice of his intention to do so.

Mr. Mulvey said he would acquiesce in that, and give notice of the alteration.

The regulations were then confirmed.

The second alteration was then considered, viz. "That Regulation 17 of the regulations for professional examinations be altered by striking out the words 'twelve months' on the sixth line thereof, and by substituting the words 'three years,' in place of the words so struck out."

Mr. Hunting asked the meaning of the substitution.

The *Solicitor* said it was it was to make Regulation 7 in accordance with Regulation 17.

Mr. Hunting thought it would make the division between the examinations practical and oral more distinct than before, the thing they wanted to avoid.

Mr. Roalfe Cox said it was intended that if a student failed in his first examination he might go up again any time within three years.

The *Solicitor* said it was for re-entry after failing in the practical.

The *Chairman* said he must fail in his practical, and then he could come up again any time during the next three years. It was a very long interval, no doubt.

Mr. Walters said it was all in favour of the student.

Mr. Mulvey said he felt inclined to confirm the first part, and not to confirm clause 2; but as they were bound to confirm it or reject it, it would be better to reject it and let matters stand as they were.

The *Solicitor* said that students were constantly complaining, and asking the Secretary which of the regulations they were to follow. He thought perhaps it would be best to let it pass, and give notice of an alteration.

Professor Pritchard said he should move the rejection of the second clause.

Mr. Hunting said he should propose its adoption, because it was only to reconcile a difference between the two rules, and it was an important educational matter that ought to be discussed.

The *Chairman* said the matter had been already discussed.

Professor Axe was also quite clear that the matter had been discussed. He was certain that Professor Brown proposed it, and it was agreed to by the Council. The Secretary referred to the minutes, and found that it was passed in July, 1889.

The motion for the confirmation was then put to the meeting and carried, one member voting against it.

The following was also confirmed:—

"That Bye-law 48 be altered by adding to the investments authorised for the funds of the College, mortgages on real securities in England and Wales, or on heritable property in Scotland, or on bonds, mortgages, or debentures of incorporations or incorporated companies paying dividends on their ordinary stock

in accordance with Regulation 17 of the Charter of 1876 and the Trusts Investment Acts."

Notice of Motion.

Mr. Mulvey gave notice of his intention to move—"That the latter part of clause 4 be left out from the words 'United Kingdom,' viz. 'provided that all these examinations include the obligatory subjects as laid down by the Royal College;' and in addition to that, that Part II all the optional subjects be left out."

SPECIAL MEETING.

A SPECIAL meeting was held at the conclusion of the confirmatory meeting for the purpose of appointing delegates to represent the College at the forthcoming International Congress on Hygiene and Demography.

The *Secretary* read several letters that had passed between Professor McCall and Mr. Ernest Clark, the Secretary of the Royal Agricultural Society, with reference to the name of the President being inserted on the Committee and asking his aid. The President had, he said, sent on the correspondence to him (the Secretary), desiring him to lay it before the meeting. Among the papers so sent was a circular containing information as to the objects of the Congress, from which it appeared that a section had been set apart to consider such subjects as the following: "Comparative Etiology," "The Relation of the Diseases of Animals to those of Man," "Infectious, Parasitic, and other Diseases communicable from Animals to Man;" and that Professor G. T. Brown had been appointed Vice-President, with Mr. Duguid as one of the joint Secretaries. A letter had been sent by him to one of the Hon. Secretaries of the Congress at the request of the President, to the effect that the circular of December last had only just come under his observation, and that it would come under the consideration of the Council at a special meeting; and that he had no doubt delegates would be appointed to represent the College at the Congress; and that a subscription would be given to the fund being raised to defray expenses. Amongst the names of the medical and other societies and corporations that had been asked to send delegates that of the Royal College of Veterinary Surgeons did not appear.

The *Chairman* thought it was a peculiar thing that the College should be left out in the cold in such a matter. He felt it most acutely.

Professor Pritchard said his suggestion was that they should leave them out in the cold.

The *Chairman* said he felt very much the same.

Mr. Walters thought it would only be becoming on the part of the College to have nothing whatever to do with them.

The *Chairman* thought Professor Brown should have said

something for their profession with regard to the matter. It would be a grave oversight for them to go there and discuss such matters as were included in the programme under the auspices of an Agricultural Society. He did not think it had any relation to agriculture at all.

Mr. Hunting considered it undesirable that they should entirely wipe themselves out in the matter; in the eyes of the public it would be a pity for them not to be represented in a congress like this. If it was not too late he thought they ought to follow out the suggestions of their President. According to his letters Professor McCall had nearly arranged with the Congress Committee that he would take part in it, and he thought it only right that the Council should back him up.

Professor Pritchard understood the President only to ask that the matter should be brought to the notice of the Council.

The *Chairman* confessed that he did not like the profession left out in such a subject. They were simply now being brought in as a kind of afterthought to assist in discussing certain matters. The College ought to have been considered in the organisation of the Congress.

Professor Pritchard thought that the Organising Committee might answer that, as Professor Brown and Professor Duguid were officials in the section, the College was represented.

Mr. Mulvey thought that, however that might be, the profession was left entirely out in the cold in the matter.

Mr. Walters said that Professor Brown was probably holding his position from his official capacity, and not as a member of the Royal College.

Mr. Roalfe Cox agreed with Mr. Hunting that it was better not, on the spur of the moment, to reject any association whatever with the Congress.

The *Secretary* said the matter began by the President writing to him and asking that the matter should be laid before the Council.

Mr. Mulvey believed the President wrote to Mr. Ernest Clark. That was how the whole matter began. The President asked that the College might be allowed to take part in the Congress.

Mr. Hunting said that the President had positively accepted a position on the Committee. He should propose that the Council, through the Secretary, should write to Mr. Clark, asking him whether it was too late to place the Royal College of Veterinary Surgeons on the list of other bodies, and if it was not too late that the College would be glad to act, and further the objects of the Congress. Mr. Ernest Clark, as far as he could find out, was really the prime mover in the matter.

The *Chairman* said that that was not so, as his name did not even appear on the circular.

Mr. Barford thought that, in deference to their President, they could not do otherwise than back him up in his wish that they should join in and support the congress.

Mr. Walters thought that if they wrote such a letter as was suggested by Mr. Hunting they would be humiliating themselves and degrading the profession.

Mr. Hunting said that the probability was that every other society had done so at the proper time.

Professor Axe said he felt, with the general body of the Council, very keenly the position in which they were placed. It appeared to him to be not exactly the position they should be in if they had received that amount of consideration and courtesy which the Organising Committee should have shown them. He thought they could make no complaint against the Royal Agricultural Society or anybody else.

The *Chairman* said he would like the President to act in the matter. He maintained that the College had a dignity to uphold, especially in discussing such a matter as this.

Mr. Barford suggested that at the earliest possible date the Secretary should communicate with the President and explain to him the exact feelings of the gentlemen round the table, as they considered that they had been decidedly neglected and passed by, and that the matter should be left in his hands.

The *Chairman* thought they were not in a position to discuss the matter then, and he would propose that the meeting should be adjourned. He did not feel inclined to arrive at any decision then. The President should be communicated with as to the result of the meeting.

This was agreed to, and the meeting adjourned *sine die.*

BORDER COUNTIES VETERINARY MEDICAL SOCIETY.

A GENERAL meeting of this Society was held at the Bush Hotel, Carlisle, on Wednesday, the 17th December. Mr. T. Greaves, of Manchester, President, was in the chair.

Present.—Dr. Fleming; Messrs. Bell, Carlisle, Dawson, and McKie, Carlisle; Coats, Brampton; Tallentire, Skelton; Pender, Lockerbie; Donald, Wigton; Chalmers, Annan; Crondace, Haltwhistle; Young, Cockermouth; Little, Abbeytown; Howe, Keswick; Troughear, High Heskett; Bell, Haltwhistle; Soulsby, Workington; Bell, Brampton; Thompson (Hon. Treasurer), Aspatria; Armstrong (Hon. Secretary), Penrith; Anderson, Hexham; and Robertson, McGowan, and King were present as visitors.

The *Secretary* intimated that he had received letters apologising for their absence from several members.

The minutes of the last meeting were approved and signed by the Chairman.

New Member.—The *Secretary* intimated that at the next meeting he should move the election of Mr. Rimmer, of Kendal, as a member of the Society.

Election of President.—Mr. Young proposed that Mr. Jacob Howe, one of their oldest members and best attenders at their meetings, be elected President of the Society for the ensuing year. *Mr. Donald* seconded the motion.

No one else being nominated for the office, the *Chairman* said it gave him very great pleasure to declare that Mr. Howe had been unanimously elected President of the Society. (Applause.)

Mr. Howe briefly thanked the members, and said he should try to do what he could to further the interests of the Society. (Applause.)

Election of Vice-Presidents.—On the motion of *Mr. Donald,* Mr. Greaves, the retiring President, and Mr. Soulsby were appointed the Vice-Presidents of the Society.

Re-election of the Secretary and Treasurer.—The *Chairman,* in moving the re-election of Mr. Armstrong as Secretary and of Mr. Thompson as Treasurer, said he could not speak too highly of the business-like habits of Mr. Armstrong, and of the careful manner in which Mr. Thompson looked after the funds of the Society. (Hear, hear.) *Mr. Soulsby* seconded the motion, which was carried unanimously.

Notices of Motion.—Mr. Donald gave notice that at the next meeting of this Society he should move the following resolutions:

1. "That this Society disapprove of members of the Council holding the dual office of Councilmen and Examiners."

2. "That this Society disapprove of the 9th clause, and request the Council of the R.C.V.S. to take immediate steps to obtain its repeal or alteration, so as to restore to members of the R.C.V.S. their original rights."

Dr. Fleming, who was received with applause, then read a paper on "Influenza in Horses" as follows:

Mr. President and Gentlemen,—Of the few diseases about which there is now anything approaching the mystery that not long ago enshrouded so many epizoötic and epidemic disorders, influenza probably holds the foremost place, so far as obscurity of origin, cause of diffusion, or mode of generalisation are concerned.

As I have shown in my work on "Animal Plagues," this malady—or one more or less closely resembling it—has been known for many centuries; attacking at one time the human species only, at another time the equine species, and in some outbreaks both species at the same period, or one species shortly before the other.

In tracing its history I have been able to discover a serious and wide-spread disease among horses in Yemen, Arabia, so long ago as A.D. 1328; this was more of a bilious fever, however, if one may hazard a guess from the symptoms described. But, in reality, the more extensive invasions have only been recorded for about two

hundred years, and, as I mentioned, some of these have coincided with influenza in man. In the last century records there is some allusion to these coincidences. Huzard, for instance, speaks of influenza attacking horses in the spring of 1776, after the human species had been affected. And in this century it so appeared in 1803, 1805, 1833, and 1858.

But by far the largest number of outbreaks among horses occurred without mankind being in any way involved.

Some of the influenza epizoöties have been very remarkable for their wide and rapid diffusion, but I cannot refer to these now without encroaching too much on the time and patience of the meeting; so those who are curious in the matter of the history of the malady are referred to my volumes on "Animal Plagues." I may make mention, however, of the remarkable epizoöty of catarrhal influenza that occurred throughout Germany, Bohemia, and Moravia in 1746; and to the perhaps still more extraordinary one, and certainly the best recorded, that appeared on the American Continent in 1872–73. This outbreak seems to have commenced in Toronto, Canada, in September, 1872, and radiating thence in every direction, it visited all the cities and towns in Canada, and spread over the United States as far south as Virginia, and westerly as far as Chicago. Within two months it had invaded the States and Territories of the far West; it spread over California, and, travelling onward, at last reached British Columbia, Cuba, Mexico, and Central America.

As has been remarked, perhaps no other disease with which we are acquainted commences more secretly and suddenly, extends more rapidly, or tends more readily to become a world-wide malady, than this; and notwithstanding our recent experience of it in mankind and horses, it must be confessed that there is very much in relation to its genesis and propagation, as well as to its immediate exciting cause, which still remains for elucidation. I cannot hope to throw any new light upon these obscure points in the pathogeny of the disease; but I will endeavour, to the best of my ability, to bring our knowledge up to date, not only with regard to these points, but also with respect to the sanitary and medical treatment of the malady.

In the first place, then, the question might be asked, What is influenza?

In the human and equine species the term has been applied to an intense febrile condition, occurring suddenly in perhaps a sporadic form for a brief period, then extending rapidly and affecting a large number of individuals—the majority in a village, town, city, country, continent, or even several continents being attacked; and this irrespective of situation, climate, season, surroundings, and even in defiance of all sanitary measures except rigid isolation. So far the malady has the same character in man and the horse. And in the symptomatology, to some extent, there is a close resemblance, if not absolute identity.

In the old descriptions of the outbreaks of influenza the disease

appeared as a severe catarrhal fever, accompanied by great depression and sickness, and running its course rapidly. We do not find much mention of complications, or of any special symptoms predominating in different invasions, except those of catarrh.

But whether these were not observed, or were not present, or whether we have now more than one disease, or a disorder somewhat multiform, certain it is that at one time we have among horses a widely prevalent affection, characterised by certain marked features; at another time, another outbreak as general, in which these are either absent, or masked by characters still more striking; and, again, in another epizoöty we shall have symptoms that would almost lead to the belief that we have quite another disorder to deal with. These differences are not remarked in individual cases in the same outbreak, but constitute general characteristics of different invasions.

Notwithstanding these diverse manifestations, there are certain features which are always present in all the outbreaks, and which compel us to cling to the old and vague term, influenza. These are the abrupt onset of the malady—the very sudden transition from vigorous health to intense prostration—from normal temperature to extreme hyperpyrexia—from activity and gaiety to immobility and profound depression in a few hours. In no disease with which I am acquainted does the temperature rise so high and so rapidly, and the physiognomy of the disorder is generally so striking, that the veriest tyro could not mistake it for any other disease. The drooping head and ears, listless look, swollen, tearful eyes, and general facial expression, betray cephalalgia, debility, and nausea; while the hot, dry skin, the pasty, burning mouth, the internal temperature reaching, perhaps, 106° or 107° Fahr., and the almost suppressed secretions—all testify to the remarkable pyrexial condition of the animal, which is still further accentuated by the pulse and respirations; at the same time the disinclination to move—the desire to remain fixed in one spot, and, if compelled to stir, the groans and stiffness—betray muscular soreness in loins and limbs.

Another feature is the rapid loss of condition—a fat animal soon becoming much reduced in bulk; but this change might be anticipated when the very abnormal high temperature—synonymous with greatly increased tissue oxidation—is considered; and the extraordinary drop in the temperature that ensues when convalescence sets in is also to be noted. I have found it in some instances as low as 97° Fahr.—the normal temperature of the horse being estimated at 100°.

Whether we have one disease presenting itself in different forms at different outbreaks, or whether different diseases are included in the designation of influenza, these general symptoms are always present in a more or less marked degree, and constitute the special features of the epizoöty.

If we assume that there is only one influenza, then we must take cognizance of its different forms, and in this regard—and not-

withstanding its offering itself as a somewhat bewilderingly multiform disorder—it may be accepted that it shows itself at different outbreaks in either of three forms, which are sufficiently distinct; though there may be complications, or accidental epiphenomena, to obscure them in individual cases.

First Form.—The simplest form is the catarrhal, in which the mucous membranes of the head are chiefly involved, and, consecutively, those of the deeper air-passages, often leading to capillary bronchitis and broncho-pneumonia under unfavorable conditions. This is perhaps the most common form of influenza, and the one which is attended with least mortality; though the general symptoms I have already alluded to may be present in their greatest development. This is the form, also, with which we are so familiar in mankind; and it is that which, both in man and the horse, becomes at times of world-wide prevalence.

But it may here be necessary to add that, however closely allied the influenza of the horse and that of mankind may be in their origin, mode of extension, and symptomatology, yet we cannot admit their absolute identity; inasmuch as the influenza of man cannot be conveyed to the horse, nor that of the latter to the human species. There is not a well-authenticated instance on record of such transmission having occurred, notwithstanding the comparative frequency of outbreaks of the disease, even within my own recollection. If such transmission were possible—at any rate, from horse to man—it must have been observed in our mounted corps in the army, where such close attention is paid to sanitary matters, and where the men are always in such close contact with their horses, whether these be well or ill.

Not only this, but the greatest outbreaks of influenza in man have not been coincident with those in the horse. When the human populations of countries far and wide have been prostrated and panic-stricken by the mysterious invasion, horses remained unaffected; and when the majority of the horses in towns and cities have been incapable of leaving their stables, because of being under the sway of their influenza, their immediate attendants, as well as the inhabitants of these towns and cities, were unaffected. Every outbreak in this country furnishes evidence of the fact that the human and equine influenza are not due to the same, but to closely allied exciting causes, and that the factor or factors which produce the disease in the one species will not do so in the other. No better, because, perhaps, no stronger, proof of this could be adduced than that yielded by the great influenza epizoöty on the American continent in 1872–3, when all horse traffic was for a while suspended, and the streets of the large cities were comparatively silent, because of the plague-stricken condition of the horses. And yet there was not a case of influenza recorded among the people. It was somewhat the same during the present year, when human influenza had spread to nearly every part of the world, and horses remained free from it.

It is somewhat curious that horses and mankind should be the

only creatures to suffer from influenza. The history of animal plagues shows that dogs and cats have, at rare intervals, been attacked by an epizoötic catarrhal fever; but these happened long ago, and though horses and mankind have been frequently visited by influenza, yet dogs and cats have remained immune, and there is not an instance known of their having been infected from man or horse.

This catarrhal form of influenza is that which becomes most generally and most widely diffused—in serious outbreaks as many as 80 or 90 per cent. of the horses becoming affected; though the mortality may not be greater than from 2 to 4 per cent. of those attacked, and convalescence is rapidly established unless there are grave complications.

Second Form.—The second form differs from the other in that, besides the general intensely febrile and adynamic symptoms which mark influenza in its several forms, the chest is chiefly involved—in fact, the disease might be termed epizoötic pleuro-pneumonia of equines. It differs from the other form in being more insidious in its invasion, less wide-spread, in that it does not invade entire countries, but is limited to certain towns, portions of towns, and even certain stables or barracks. Indeed, it would almost appear to be enzoötic; for we have a barrack in London, in which a regiment of the Household Cavalry is located—Regent's Park Barracks—in which almost every year there is an outbreak. Rarely witnessed in stables containing only a few horses, this form appears where large numbers are kept, and it is perhaps the most troublesome form to contend with, as it is attended by the largest mortality, and is followed by the most protracted convalescence. Sanitary arrangements did not seem to have much influence on its extension, as it manifests its presence in good stables as well as bad; though there must be some local influence at work to account for its erratic course, distribution, and persistency in some places, while others remain exempt—though adjoining those infected—or the disease soon disappears if it does invade them. Catarrhal symptoms may be entirely absent, a very slight nasal discharge of a transparent yellowish fluid only being noted. Almost from the commencement there are indications that the lungs are extensively involved; and yet so intense is the debility that—contrary to what usually happens in sporadic pneumonia—a stricken animal often lies down—particularly towards the end of the attack, when dissolution is impending. A septic or gangrenous condition of the lungs is indicated—even before death occurs—by the odour of the exhaled air from the nostrils, and the putrid blood discharges from the same openings; indeed, it is not unusual to find, on *post-mortem* examination, that there are local hæmorrhages into various tissues and organs, and general appearances which would lead to the supposition that the horse had succumbed to septicæmia.

Third Form.—This form is like the last in so far that it is erratic and limited in its spread, appearing only here and there in

towns, and in being localised in districts or counties. But it differs from it in the skin and subcutaneous tissues being mainly involved —in fact, the disease might be considered as erysipelatous. The head and limbs are the parts chiefly attacked, and sometimes these attain a great size; the lower surface of the chest and abdomen also frequently share in the tumefaction. The digestive organs are implicated in some outbreaks of this form of influenza; their mucous membrane, and also that lining the nasal passages being congested, softened, ecchymosed, and in severe cases sloughing in patches. In this form convalescence is somewhat long, but the mortality is not very great when proper treatment is adopted. These are the forms which, I think, we may assert that influenza assumes. Of course they may be modified in individual cases by circumstances; but their general features will be recognised by those who have had a considerable experience of the disease.

With regard to the cause of influenza, I do not hesitate to class it with those maladies which are produced by microbes; and this notwithstanding the fact that no special organism has yet been fixed upon as the influenza germ. But that it will be isolated, examined, cultivated, and its life history studied, I entertain no doubt whatever; indeed, it may happen that we shall be able to utilise it by compelling it to provide an antidote for its bane. The development, course, and symptoms of the malady point out in the clearest manner that it is of microbic origin; though whether the three forms I have referred to are due to one and the same germ is extremely doubtful.

The erysipelatous form reminds one very much of one of the forms of anthrax met with among horses in India, in which external swellings are a special feature. Indeed, the Austrian veterinary surgeons are inclined to regard this form of influenza as anthracoid in its nature; and they base their opinion on the fact that they have found anthrax bacilli in the exudations and tissues of sick animals. But anthrax, as we see it in India, is much more rapid in its course and fatal in its termination than this form of influenza. However, there is no reason why the microbe producing it should not be a modification of the *Bacillus anthracis*, modified by climate and other conditions. At any rate, it appears to be proved that the pectoral form of influenza of the horse is due to diplobacteria; and the analogy of the disease to septicæmia is further strengthened by the circumstance that, when these bacteria are inoculated into mice, these rapidly die of septicæmia.

The catarrhal form of influenza may be due to another kind of micro-organism—probably the pneumococcus or the bacillus of Friedlander.

Climate and temperature do not appear to have any influence in its production. It prevails in the most diverse climates and at all temperatures, and the closest and most extensive and recent observations show that it does not spread by virtue of any of the recognised conditions of cold, heat, humidity, season, climate, or altitude. In the epizoöty on the American continent it prevailed

and was propagated in the cold of a northern winter, and in the summer heat of Central America; in the dry air of Minnesota, and in the moist air of the seaboard; at an altitude of 5000 feet above the sea (at Saltillo, Mexico), and on the low levels of New Orleans (10 feet above sea level). And it is certainly not disseminated by winds, but often spreads against them.

The notion that influenza is due to an excess of ozone, or the presence of any other gaseous or material product in the atmosphere, cannot be entertained nowadays. If such were the case, many other species of creatures besides man and the horse would suffer at the same time. This does not seem to have struck those who, for so many years, have tried to account for the prevalence and extension of the disorder on this hypothesis.

That influenza is infectious I personally have no doubt, though that it may be extended in other ways than by immediate contact of sick with healthy horses I am not prepared to deny. The proofs in favour of its infectiousness in horses support my opinion, and this opinion I have entertained for very many years, as will be seen by a reference to my work on "Veterinary Sanitary Science and Police." In the American outbreak of 1872–3, for instance, it commenced at Toronto, and spread thence as from a centre, no locality being exempt which was known to have been in communication by means of horses or mules with places in which the disease existed; and those places which were not visited by it were so situated that the introduction of horses or mules was in some of them impossible, and in others of them improbable. Another proof which I rely upon is that equine influenza has not, so far as I can ascertain, ever been witnessed in Australasia, South Africa, India, or New Zealand, and this because, as I view it, it has never been carried there. The microbe which causes it in horses has no action on other creatures; and it may be taken for granted that, once it obtains access to the body of a susceptible animal, it can multiply in a wonderful manner, in order to produce those chemical changes in the fluids which enable them to act on the organism as if most active septic matter had been introduced into it.

I may call attention to the fact that the ass, which is so nearly allied to the horse, appears to be exempt from influenza; for I have never met with or heard of its occurrence in that animal, and even mules do not appear to be very susceptible.

Of the influences which are at work in exciting the activity of the microbe at certain periods we know nothing. We may assume that it can multiply without as well as within the body, like the germ of miasmatic diseases, and that certain atmospheric or telluric conditions favour its development and multiplication to an astonishing degree. Though we are in ignorance of those conditions which favour the growth and spread of this particular microbe—the existence of which we can only assume for the present—yet it must be confessed that we are no wiser with regard to the genesis and advent of creatures which are well known, and which are also

injurious to the interests of mankind. Take the immense swarms of locusts which in some parts of the world, at uncertain periods, sweep over great surfaces of the earth, consuming everything in the nature of vegetation which they meet with on their long flight; or the countless swarms of field-mice or similar vermin, which spring up now and again, in certain countries, from nobody knows where, and devastate great tracts. Why should similar influences not operate in the evolution of myriads of influenza-exciting micro-organisms?

But experience demonstrates that, if the microbe can multiply outside the body, it can also multiply within it, and that therefore a diseased animal can infect healthy ones; and there can scarcely be a doubt that infection is a potent factor in the spread of the malady.

With regard to the treatment of the disease, I confess to having little faith in the administration of drugs, but rely more on good nursing, cleanliness, plenty of fresh air, ample space, and comfort.

Medicines which act as germicides, when they can be administered with safety, may be given. Those which operate in reducing the fever generally act in this way. For many years I relied solely on preparations of quinine, and have reason to believe that it has an almost specific effect in influenza. Preparations of carbolic acid are, of course, much less expensive, and might have a similar effect; so might antipyrin, and other antifebrile remedies. But I need not dilate on the treatment of the disease, as I have no doubt you are all perfectly well aware of the necessity for dealing with symptoms as they arise; and as these vary more or less in nearly every case, close watchfulness and keen judgment are needed, and not rule-of-thumb practice.

The *Chairman*, inviting discussion on the paper, said the subject was a most important one, and it behoved the members of the profession to learn how to treat this disease and stamp it out. They were scarcely ever free from influenza in Manchester, and at the present time it was prevailing to a very large extent. The appearances were simply drooping of the eyelids, swelling of the limbs, stiffness, and a fevered pulse, reaching sometimes to 96. The majority of cases got better unless there was some old-standing disease; perhaps not more than one in twenty or one in thirty terminated fatally. As to treatment, good nursing was essential. He used hay tea largely, and in cases where the horse was very low mild stimulants. In every case care should be taken to keep the stable healthy; and if that was done they would find that the majority of cases would do well. As to the cause of the disease, it might be a microbe or it might be simply a subtle poison in the air; but he hoped the time was not far distant when an antidote which would eradicate the disease. Mr. Thompson said they had not many cases of influenza in this part of the country. He had, however, seen seven cases of what was called "pink-eye" within

the last month ; the symptoms were identical with those described by Mr. Greaves. One of these cases was at West Newton and another at Aspatria, and it was found that about a week before horses had been brought into those stables from a stable in Carlisle where pink-eye or influenza was prevalent. The disease had been carried about the country by the animals themselves in actual contact. Good nursing and plenty of fresh air were necessary in treatment of cases of influenza ; and as to medicine, he gave carbonate of ammonia (in lower stages) or chlorate of potash.

In reply to the Chairman *Mr. Thompson* said that he had never seen purging in a horse produced by giving it carbonate of ammonia, provided it had not had purgative medicine before.

Mr. Young said he could bear Mr. Thompson out as to the beneficial use of carbonate of ammonia.

Mr. Dawson said that he had had a number of cases of influenza in Carlisle of the type known as "pink-eye." With regard to treatment, he thought that advocated by Dr. Fleming was the best. He was a great believer in fresh air and good nursing with moderate counter-irritation, such as that produced by mustard or fomentations with hot water. He fomented the chest, both sides, and the front of the animal. Blankets were tied all round it, and the hot water was poured on to the blankets and allowed to soak through. The mustard was also applied to the chest.

The *Chairman* said Dr. Fleming was desirous of eliciting opinions as to the different forms of influenza. Near Manchester they had had it, at one time or another, in all the forms mentioned by the doctor. His advice to them was not to use any external applications unless the breathing was accelerated. One of the most interesting questions raised by the paper was as to whether the disease was contagious or whether it was attributable to some virus which existed in the atmosphere. Amongst the cases which he had attended were four of five horses at a certain hall about nine miles from Manchester. Those horses had not been where there was any disease, but still they became infected. Six or seven miles on the opposite side of Manchester they had seven or eight horses suffering from the disease which did not come into Manchester, or even with other horses. These cases supported him in his opinion that the disease was not contagious. Over and over again he had taken his own horses into stables where the disease existed, and they had not become infected.

Mr. Bell, of Carlisle, said that in that district they had opportunities of seeing the disease in its various forms. The dealers' horses which came from Ireland were very susceptible to the disease in the form first described by Dr. Fleming. The discharge from the nose of horses which had arrived in the town in railway boxes was frequently found to have the disease. From that he was led to believe that those boxes were a means of conveyance, and hence, that it was infectious. He agreed with Dr. Fleming that the less that was done to animals which were suffering from the milder form of influenza the better. He did not as a rule order external appli-

cations, even if there was disturbance of breathing; and he never gave stimulants. In his opinion the horse-boxes on railways were the means of conveying a great amount of disease. They could have cattle trucks disinfected every time they were used, and he asked why that could not be done with regard to horse-boxes, in which animals of much greater value were conveyed. He thought it was time that, in the interest of their clients, railway companies should disinfect horse-boxes after they had been used.

Mr. Anderson expressed surprise that no practitioners from Newcastle were present, as the disease was very prevalent there. Some years ago he had many cases under his care, and he found that if he could get the kidneys to act fairly at first the animals generally recovered. In some cases the kidneys were found to be petrified. As to whether the disease was communicable from man to the horse, or from the horse to man, he might say that whole families were laid up with influenza in his district last year, but there was not a single case amongst the horses. In his cases disease was spread by a microbe; and with regard to its different forms he had had experience of what he might term a rheumatic form.

Mr. Howe said that as far as he knew there had been no cases at Keswick. Many of the Irish horses Mr. Bell spoke of had had coughs, but there was no appearance that they were suffering from influenza.

Mr. Soulsby said he had had many cases of influenza recently, and as regards the majority, he found that they differed from each other. In some cases the disease extended no further than the throat; in others it was all over the body; and, again, other cases were of the rheumatic nature of which Mr. Anderson had spoken. In most instances he had been troubled by the costiveness of the animal. As to whether the disease was infectious or not, he might say that some horses which had lately been brought from Edinburgh, and which were all coughing, were (against his advice) sent down a pit where there were 50 other horses, and yet none of these other horses had taken it. It was not the first time that horses suffering from coughing had been sent down a pit, and still none of the other horses in the pit had taken it. Counter-irritants, he found, did more harm than good, but he was a great believer in diffusible stimulants.

Mr. Donald said that his experience was that they could not lay down any particular line of treatment for influenza. In every case they should rely upon good nursing and plenty of fresh air, and treat complications as they arose; and he thought those who adopted the most conservative principles of treatment would be the most successful. One almost felt ashamed to question anything which Dr. Fleming said, but he really did not think that there was any positive evidence that influenza was due to a microbe. He believed it was a fault of the pathology of the present day to attribute everything to microbes. He should like to know by whom the microbe of influenza had been cultivated, as he had not

read of it. There was not a tittle of positive evidence to show that the disease was due to a microbe.

Dr. Fleming.—Will you kindly give us your opinion as to what is the cause of it?

Mr. Donald.—I have not yet formed an opinion, although I am convinced that it is contagious. I do not see anything to show that it is caused by a microbe.

Mr. Thompson asked how the President accounted for the disease passing through the stables in Manchester if it was not contagious or infectious?

The *Chairman* said that his opinion, based on an experience of over fifty-six years, was that influenza was not infectious. He believed it was due to a subtle poison in the atmosphere, to which one horse was more susceptible than another. It might be that this subtle poison was a germ, and he should not be surprised, as science gave them more knowledge, that a microbe would be found at the bottom of it. As to external applications, he was strongly against the use of them.

Mr. Bell said he could give hundreds of instances where a single animal, coming from a district where the disease existed, had brought disease into a district where it had not previously existed. Did not that prove conclusively that the disease was infectious?

The *Chairman* said that the cases cited by Mr. Bell would be of value if he could prove that the horses would not have become affected if the imported horses had not been placed amongst them.

Mr. Bell.—How does it come that the disease frequently confines itself to one yard? The same atmospheric influence is at work over all the district as in that yard.

The *Chairman.*—Very likely the stables are more unhealthy than the other stables. He mentioned a case in the Manchester Corporation stables to bear this out.

Dr. Fleming asked for an expression of opinion as to whether the disease could be transmitted from the horse to man or from man to the horse.

Mr. Howe said they had a number of cases of influenza in the human species in his district, but no cases of it in animals.

Mr. Donald and *Mr. Thompson* expressed the opinion that the disease was not transmissible.

Mr. Anderson said many dogs near Hexham were affected with a disease closely resembling influenza, and he should like to have an opinion as to whether or not it was influenza from which they were suffering.

Mr. Pender then said: I have no doubt that the ordinary form of influenza which spreads through districts after fairs is contagious, although there may be many instances of non-susceptibility, owing to the nature and condition peculiar to the animal or animals affected, as well as those which have been in contact with diseased without becoming infected. With regard to that peculiar form of influenza called "pink-eye" I may say that, living in a purely agri-

cultural and pastoral district, I have no experience of the disease in an epidemic form, although I have frequently, in certain seasons and atmospheric conditions, seen horses showing all the symptoms characteristic of the disease which have been fully and clearly described here to-day by Dr. Fleming and Mr. Greaves. From all that I can make out this seems to be a disease which in this country horses in seaport, manufacturing, or large towns near some considerable river are peculiarly liable to, especially in certain seasons and atmospheric conditions. Some towns, I understand, are rarely if ever entirely free from the disease in one form or other. Now, as to the disease being contagious, it appears to me that if it be so in the proper sense of the term there are at the same time many instances where affected animals do not transmit the disease to others they have been in contact with, but I should say that in this disease, as in many others, all that is wanted to render it transmissible to others are certain conditions inimical to the health of the animal, by which certain changes are effected on certain matter in the body, rendering it poisonous to the animal in which such changes are effected, and generally to those of its kind, but at the same time a natural food for a certain organism. When the carcass is so, then will the eagles be gathered. To my mind, those organisms which most scientists of the present day tell us are the cause of this and that disease play a most important function in the animal world as nature's scavengers; and just as in some dirty towns in certain parts of this planet there are dogs, vultures, and other animals which do the most of the scavenger work, removing carrion and other filth from the streets, so do those small organisms remove the filth from the street and alley, creeks, and hidden parts of larger organisms. But what is an organism? It has oftentimes struck me as most remarkable that we should be supplied daily with so much information about the great devastations caused by those mighty invaders, microbes, for so many years, and no one has thought it necessary to give anything like a satisfactory definition of what an organism is. I cannot account for it in any way except it be owing to what I believe to be a fact, that the most of scientists of the present day are rather too materialistic. They seem to put no reliance on information obtained through the conceptive, imaginative, and calculative qualities of the human mind, and can hardly believe in the existence of anything which they have not become cognizant of through those senses common to animals. What, then, is an organism? or rather, what is a healthy living organism? I would define it thus:—A healthy living organism is matter in a certain condition adapted to the nature and constituting the embodiment of an imperceptible, immaterial, indestructible, vital energy, having individual characteristic property and function, all vital processes and action being governed and regulated by the fixed laws of affinity and adaptation. I therefore conclude that if our domesticated animals were treated somewhat more nearly in accordance with their nature and requirements in order to maintain them in a healthy condition, this applies

also to man, we would soon hear much less about contagious diseases in man and beast.

Dr. Fleming, in replying upon the discussion, said the evidence was strongly in favour of the opinion that influenza was infectious, and he maintained that all diseases which are transmissible from the sick to the healthy are due to a microbe. In no other way could they explain the production of the disease. The germ theory explained the infection, the cause and the termination, and the spread of the malady, and by no other theory could they explain the whole of these things. With regard to the transmissibility of the disease from man to horse and from horse to man, he had pointed out the coincidence of certain outbreaks in man and in the horse, but these must have been mere coincidences. The germs were undoubtedly closely allied, but one would not live in man, and one would not live in the horse. As to dogs, he thought that if they could be influenced by anything which was in the air during an epidemic of influenza, surely they would have had the large kennels throughout the country affected, but such was not the case. With reference to treatment, he thought there were more horses killed by over-treatment than by under-treatment. His belief was that the best thing was to get the animal into as healthy a stable as possible, and nurse it carefully, and abstain from irritating it. If drugs were used, let them be drugs which were known to have specific effects.

The *Chairman* moved a hearty vote of thanks to Dr. Fleming for the very able paper which he had read to them.

Mr. Bell, in seconding the motion, gave notice that at the next meeting he should move the election of Dr. Fleming as an honorary member of the Society.

The motion was carried with applause, and was briefly acknowledged by Dr. Fleming.

A vote of thanks to the chairman, on the motion of *Mr. Donald*, seconded by *Mr. Thompson*, brought the meeting to a close.

After the meeting the members present and a few friends (including the Mayor and ex-Mayor of Carlisle) dined with the President, Mr. Greaves.

Dinner over, the usual loyal and complimentary toasts were duly honoured. Several songs were sung by Messrs. Thompson and Anderson, and a very pleasant evening was spent.

JOHN ARMSTRONG, *Hon. Sec.*

SOUTH DURHAM AND NORTH YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

A meeting of this Association was held at the North-Eastern Hotel, Darlington, on Friday, December 12th, 1890. In the absence of the President, Mr. Nettleton was voted to the chair.

Present.—Messrs. F. R. Stevens, Darlington; A. Peele, West Hartlepool; W. E. Lawrence, Stockton-on-Tees; T. Bowhill, Darlington; and the Secretary.

Apologies for non-attendance were received from Messrs. G. T. Pickering, York; H. Gelsthorpe, Darlington; and Mr. W. T. Briggs, Darlington.

The minutes of the previous meeting were taken as read, and confirmed.

Letters were read from Dr. Hutchinson and Dr. McCullagh, of Bishop Auckland, thanking the members for their election as honorary associates.

Mr. Peele related an interesting case of traumatic pericarditis produced by a large steel nail which he showed.

Mr. Awde gave the history of a case of gangrene supervening on parturient fever in the cow.

Mr. Nettleton related the course of procedure under the New Pleuro-pneumonia Slaughter Order, he having had recent experience of it.

Messrs. Percival Snaith, M.R.C.V.S., Bishop Auckland, and Thomas Rickaby, M.R.C.V.S., Guisborough, were elected members of the Association. Mr. H. H. Roberts, M.R.C.V.S., Coundon, was nominated for membership; also Professors Axe, Walley, Williams, and Thomas Greaves as honorary associates.

A resolution from the North of England Association, asking this Association to meet them once a year at some time and place to be mutually agreed on, was next considered, and a committee appointed to confer with them as to its feasibility or otherwise.

Mr. Nettleton then introduced a discussion on "A New Charter; is it needed?" by reading the following paper setting forth his views on the subject:—

Mr. President and Gentlemen,—Our journals of late have been overflowing with opinions as to whether a New Charter is necessary for the better government of our profession or not, and my apology for writing on the same subject is that nearly all are on one side, and those who differ from the majority do not take the same views in the matter as myself. Mr. Hunting says that "new Charters are no novelty, as we have three precedents, and it only remains to be shown that another Charter would be advantageous to demonstrate the necessity and expediency of applying for it. Unless it can be clearly shown that a necessity does exist for a new Charter it would be useless to take any steps towards obtaining it."

Now, I maintain that we cannot show any necessity. What argument can we bring forward? Practically none. The Ninth Clause argument is supposed to be the best, but when the Fellowship is open to every member who cares to take it, this argument would soon break down. Now, just consider how many men the repeal of this Clause would benefit. I assert it would not benefit more than a dozen in the same number of years. Then are we,

as a body, to spend a large sum of money merely for the good of so small a number as this? I think we should be very foolish to do so.

Then take the Vice-Presidents and the dual appointments, the objections to those exist mostly in imagination, I will therefore not argue those objections with you, but simply confine myself to the Ninth Clause. Now, we will take the profession as it stood in the year 1875. We then had two qualifying bodies, viz. the Royal College of Veterinary Surgeons and the Highland and Agricultural Society of Scotland. In the year 1879 the Highland and Agricultural Society of Scotland's Examinations were done away with on the understanding that its members should become members of the Royal College without examination, providing they paid the usual fee, which most of them did. This, certainly, was not fair to the members of our College, but I suppose it was the only way out of a difficulty, and I believe very few took exception to it. When I say it was not fair, do not think for one moment that the Highland and Agricultural Society's Examination was a mere sham —far from it. Having been examined by both bodies I can testify to the two examinations being pretty nearly equal—in fact, I have known men rejected for this examination who have passed the Royal College Examination the next day. In the year 1883 a Charter was applied for which was to do great things for us, but unfortunately in the Bill passing through Parliament it had to be so altered that it was—so far as the then existing members were concerned—shorn of most of its beauty. We then had to take in another class of men, the so-called existing practitioners. It may be said, and correctly so, that those men have nothing to do with the profession; no more they have, but we were compelled to recognise them by placing their names on the Register, and to allow them to follow their calling. I contend this was a great hardship, but, again, the only way out of a difficulty. Those are two cases where the old members have suffered, more or less, for the benefit of the younger ones. So much for benefiting, at our own expense, three classes of men—the Highland and Agricultural Society's men, the non-qualified men, and the junior members of the profession. Had this been all I am sure we, as a professional body, would not have grumbled. But previous to those two Acts passing the Fellowship Degree was created. Well, gentlemen, we all know that the majority of the Fellows were practically self-elected—they simply paid their fee, but passed no examination of any kind, and those who have passed since are miserably small in numbers compared with the size of the profession, and the Ninth Clause has failed to coerce them to it. Men who have been in practice for a number of years strongly object to again become schoolboys. I believe I am correct when I say that under fifty have offered themselves for this coveted degree, which is a very small number indeed compared with the numbers that are eligible for Fellowship. My remarks respecting the Fellows do not apply to those who have passed the examination for that degree. What

I propose to do is to allow every man who was a member previous to the passing of the Fellowship Charter to be allowed to become a Fellow without examination, providing he pays the usual fee, but if this could not legally be done he should be admitted on passing a formal practical examination. For I contend that he is as much entitled to the degree as the man who first became a Fellow. Now that a number of years have elapsed since the Fellowship was first created it could very well be done without any hardship to anyone. The only men likely to grumble would be the small number who have passed the examination, and their hardship would be less by far than on the present old members. The members who have passed since 1876 can have no grievance, as they were not in existence at that time. I must here confess that I should look a long time at £15 before I parted with it for the Fellowship. But this goes for nothing, as there are men of a far more ambitious nature than I am who would give twice that amount for it, providing they could escape the ordeal of an examination—good men too. There are now about 1,500 members on the Register who passed previous to 1876. Now, for argument's sake, say only 500 came forward, this would mean something like £7,500 to the College fund. A nice sum which the College could afford to set apart for research, which would be very different from the miserable £250 which it is now offering for this very important object.

Gentlemen, I have given you my ideas on the subject in a few very brief words, which, I trust, will convey my meaning, and shall be very pleased to have your views on the matter.

A good discussion followed—the general feeling seemed to be that the time had arrived for a new Charter to be obtained. One member suggested, with regard to the dual appointment, that if a member of Council was elected to any position of profit, that he should resign his seat, and offer himself for re-election by the profession.

A vote of thanks was then accorded Mr. Nettleton for his paper.

The *Secretary* reported that he had seen a certificate signed by a non-qualified man, with the letters M.C.V.S. after his name, and asked that a committee be appointed in order to consider such cases of infringement of the Veterinary Surgeons' Act, and if the Registration Committee declined to prosecute that they should take the matter up. The whole of the Association was appointed a committee for such purpose. The Secretary promised to secure the certificate if possible.

Mr. Nettleton was under the impression that, as is done by the Society of Apothecaries, all that was necessary was to sue the offender in the County Court for the sum of £20, being the penalty incurred by infringement of the Act.

A vote of thanks to the Chairman closed the proceedings.

W. AWDE, *Hon. Sec.*

NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY.

The Veterinary Mutual Defence Financial Statement from January 1st to December 31st, 1890.

1890. *Cash Received.*	£	*s.*	*d.*	1890. *Cash Paid.*	£	*s.*	*d.*
Balance in Bank Jan. 1st, 1890	501	2	9	April 22nd, Cash Mr. C. Moir	17	18	6
Subscriptions in 1890	63	10	6	March 29th, Cash Cobbet and Wheeler	0	10	6
Bank Interest, June	5	14	3	September 20th, for rooms	0	15	0
Ditto, ditto, December	4	1	3	Wrappers, stamps, &c.	2	0	0
Cash in hand Jan. 1st, 1890	4	6	4	Sundry other expenses	1	0	10
Excess of cash into Bank	3	9	6	Sept. 12th, transferred to Benevolent Fund	400	0	0
				Dec. 31st, Cash in Bank	159	19	9
	£582	4	7		£582	4	7

Audited and found correct,

EDWIN FAULKNER.

THOMAS GREAVES, *Hon. Treasurer.*

January 13th, 1891.

The National Veterinary Benevolent Financial Statement from January 1st to December 31st, 1890.

1890. *Cash Received.*	£	*s.*	*d.*	1890. *Cash Paid.*	£	*s.*	*d.*
Balance in Bank Jan. 1st, 1890	463	0	8	Sept. 29th, Cash paid in to the Corporation of Manchester	900	0	0
Cash in Mersey Docks	1900	0	0	Cash in Mersey Docks	1900	0	0
Sir F. Fitzwygram's donation	1	0	0	Dec. 31st, Cash in Bank	46	4	7
Four Dividends from Mersey Docks	73	7	4	Cash in hand	0	10	0
Bank Interest, June and December	9	6	7				
Cash from Defence Fund	400	0	0				
	£2846	14	7		£2846	14	7

Audited and found correct,

EDWIN FAULKNER.

THOMAS GREAVES, *Hon. Treasurer.*

January 13th, 1891.

JNO. B. WOLSTENHOLME.

List of Subscriptions to the National Veterinary Benevolent and Mutual Defence Society, 1891.

1890.	January	£	s.	d.
1.	Mr. R. Over	1	1	0
	— R. C. Trigger	0	10	6
3.	— F. G. Samson	0	10	6
	— J. C. James	0	10	6
	— J. D. Overed	0	10	6
	— S. Locke	0	10	6
	— C. Sheather	0	10	6
	— E. Nuttall	0	10	6
	— W. Whittle.	0	10	6
	— Henry Thompson	0	10	6
	— John Freeman	0	10	6
4.	— William Bower	0	10	6
	— A. L. Gibson	0	10	6
	— W. H. Webb	0	10	6
	— E. H. Leach	0	10	6
	— G. Oliver	0	10	6
	— Henry W. Caton	0	10	6
	— G. Rugg	0	10	6
5.	— G. Banham.	0	10	6
	— R. Cox	0	10	6
	— R. S. Reynolds	0	10	6
	— F. Dunn	0	10	6
7.	— W. Woods	0	10	6
9.	Professor Walley	0	10	6
	Mr. J. B. Taylor	0	10	6
	— Henry Hogben	0	10	6
	— T. G. Chesterman	0	10	6
	— Henry J. Goodall	0	10	6
	— W. Roots	0	10	6
11.	— William Carless	0	10	6
	Messrs. Elam & Jackson	1	1	0
	Mr. R. C. Edwards	0	10	6
	— C. Morgan	0	10	6
14.	— J. M. Axe	0	10	6
17.	Messrs. P. Taylor & Son	1	1	0
	Mr. R. Cartwright	0	10	6
	— Osborn Hill	0	10	6
	Messrs. Batt & Son	1	1	0
18.	Mr. B. Cartledge	0	10	6
	— R. Riddler	0	10	6
	— T. E. Anger	0	10	6
21.	— E. Faulkner	0	10	6
22.	— P. M. Walker	2	2	0
	— Henry Olver	0	10	6
24.	— R. Mackinder	1	1	0
	— C. Moir	0	10	6
	— F. Danby	0	10	6
27.	— William Dobie	0	10	6
29.	— T. D. Broad	0	10	6
31.	— J. Anderton	0	10	6
	— F. Deighton	0	10	6
	— Scrivens	0	10	6
	— J. Bale	0	10	6

	February.	£	s.	d.
2.	Mr. T. Aubery	0	10	6
6.	— T. Barker	0	10	6
8.	— James Rowe	0	10	6
10.	— F. T. Stanley	0	10	6
11.	— T. Secker	0	10	6
12.	— T. Hopkins.	0	10	6
14.	— A. Over	0	10	6
16.	Messrs. Ball & Sons	1	1	0
	Mr. T. Barker	0	10	6
22.	— T. Collins	0	10	6
	— B. Russell	0	10	6
25.	— J. M. Ferguson	0	10	6
	— James Storrar	0	10	6
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	March.			
1.	Messrs. J. & A. Lawson	1	1	0
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	April.			
15.	— W. Wolstenholme	0	10	6
25.	— Thomas Pratt	0	10	6
	June.			
5.	— J. Woodyer	0	10	6
	July.			
24.	— W. A. Field	0	10	6
	August.			
31.	— T. Greaves	0	10	6
	September.			
7.	— A. R. Perrins	1	1	0
	— T. A. Dollar	0	10	6
14.	— G. Newsom.	0	10	6
	— William Williams	0	10	6
24.	— H. Ferguson	0	10	6
25.	— T. Briggs	0	10	6
	Messrs. J. Leather & Son	4	4	0
	October.			
6.	Mr. T. W. Cave.	1	11	6
9.	— Beddard	0	10	6
10.	— G. E. Bowman	1	11	6
12.	— E. H. Jacobs	1	11	6
21.	— James Clark	1	1	0
31.	— C. Hartley	1	11	6
	November.			
7.	— E. Kitchen	1	1	0
29.	— Henry Blunt	1	11	6
	December.			
16.	— J. L. Barling	0	10	6
		£63	10	6

Audited and found correct, EDWIN FAULKNER.

THOMAS GREAVES, *Hon. Treasurer.*

January 13th, 1891.

NEW MEMBERS OF THE PROFESSION.

At meetings of the Board of Examiners held in Edinburgh and Glasgow, on and between December 18th and 23rd, the following gentlemen passed their *Final Examination* and were admitted members of the Royal College of Veterinary Surgeons.

Dick Veterinary College.

Mr. J. Boase	Dundee.
— H. C. Harris	Edinburgh.
— H. Kenny	Edinburgh.
— W. J. McCartan	Newtownard, co. Down.
— S. Stockman	Edinburgh.
— J. Thompson	Hetton-le-Hole, Durham.
— R. St. John Walley	Edinburgh.
— W. B. West	Dublin.
— W. Williams	Llandre.
— D. H. Wood	Falkland, Fifeshire.
— G. H. Yates	Widnes.

New Veterinary College.

Mr. J. D. Baker	Limerick.
— R. Bell	Arbroath.
— J. Brand	Belfast.
— M. A. Cassidy	Enniskillen.
— J. Cockburn	Kelso.
— T. Hume	Kelso.
— J. P. Isherwood	Edinburgh.
— J. A. R. Towers	Liverpool.

Glasgow Veterinary College.

Mr. P. Connolly	Warrenpoint, co. Down.
— A. J. Milligan	Dalbeattie.
— T. B. Muter	Glasgow.
— A. Hill	Ballynahinch, co. Down.
— R. H. Dalgleish	Glasgow.
— A. Millar	Lochwinnoch, Renfrew.
— J. Kinnear	Glasgow.
— T. H. Griffin	Skerries, co. Dublin.
— B. Ferrie	Paisley.
* — W. S. McMurrich	Helensburgh.
— C. A. Squair	Kildrummie, Nairn.
— J. Meikle	Stranraer.
— W. Logan	Ayr.
— D. Clark	Kilmarton, Argyle.

* Marked thus, passed with *Great Credit*.

The following gentlemen passed their *Second Examination*:

DICK VETERINARY COLLEGE.

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— T. Smith.
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Mr. G. F. Prickett.
* — J. Tainsh.
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— H. Shaw.

NEW VETERINARY COLLEGE.

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Mr. T. H. Jowett.
— J. M. Lund.
— T. Lanchester.
* — J. W. Martin.
* — W. C. Patrick.
— R. Taylor.
— C. D. Wishart.

GLASGOW VETERINARY COLLEGE.

Mr. H. H. Hazel.
† — F. T. Barton.
— H. L. Chambers.
Mr. W. M. Williams.
— R. Mason.

The following gentlemen passed their *First Examination*:

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— W. Connor.
* — M. Dugdill.
† — E. R. Gibson.
— G. R. Grant.
— E. Hall.
— C. G. Hill.
Mr. R. Harris.
— J. Hamilton.
— J. W. Masheter.
— W. S. Mills.
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In addition to these Prizes the Royal Agricultural Society awards a *Silver* and a *Bronze Medal* to the two Students who may pass the best examination in the Pathology of Cattle, Sheep, and Pigs, at the Diploma Examination of the Royal College of Veterinary Surgeons.

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A Student, during his Academical Course, has to undergo *three* examinations by the Royal College of Veterinary Surgeons. To be eligible for the FIRST he is required to attend, *at least*, one Winter and one Summer Session; a second Winter and Summer Session before being eligible for the SECOND examination; and a third Winter and Summer Session before being examined for the Diploma of the College.

The Examinations are held in May and December.

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